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ABSTRACT

This document contains 82 papers and 6 workshop presentations from a conference on distance teaching and learning. The following are among the papers included: "Examples and Tools for Building Web-Based Learning Experiences" (Steven A. Ackerman, Thomas Whittaker); "Online Testing in Distance Education" (Tricia Ahern); "Skills and Expertise for an Effective Online Distance Education Instructor" (Mohamed Ally);"The Ins and Outs of a Team Web Course Development Strategy" (Cheryl L. Bielema, Carl Hoagland); "The Student Voice" (Katharine A. Bohley, Elizabeth A. Kiggins, George Weimer); "The Benefits of Video and Web-Based Technology in a Distance Learning System" (Stacie Brigido, Dennis McCarthy); "Conducting Learner Analysis to Adjust Online Instruction for Your Faceless Learners" (Seung Youn (Yonnie) Chyung);"Involving the Deaf Community in Distance Teaching and Learning" (Simone Conceicao-Runlee, Rosmary M. Lehman); "19 Motivational Strategies for Use during Professional Development Workshops"

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(Thomas E. Cyrs, Carol A. Cyrs); "Distance Education Library Services" (Mollie M. Dinwiddie, Linda L. Lillard); "College Composition Comes to High School" (William Dynes, Elizabeth Kiggins, Dawn Colavita); "Astronomy for 10-Year-Olds" (H. Geissinger, D. McKinnon);"Measuring Information Bandwidth in Online Instruction" (Hoyet H. Hemphill); "E-Learning at General Electric Medical Systems" (Glenn C. Hoyle, Brian J. Adams, Kirk Robertson);"Identification of Successful Learning and Learner Support Systems from a Third Year eHighSchool Program" (Susan L. Jones); "Understanding Independent Learners' Attitudes to and Preferences for Media Technologies" (Adrian Kirkwood); "Strategies for Effective Student/Student Interaction in Online Courses" (Mary Ann Kolloff); "'Soft Skills' from a Distance" (Michael A. Konopka, Mary-Blair Dupre); "Designing Online Animated Tutorials and Learning Games Using Flash and Toolbook" (Dan Lim); "Virtual Universities Need Real Guidance Counselors" (Andrew Linder); and "Creating Authentic Learning Environments on the Web" (Anju Relan). Some papers contain substantial bibliographies. (MN)

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17th Annual Conference on

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Conference Proceedings

August 8-10

Madison

Wisconsin

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DISTANCE
2001
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17th Annual Conference on Distance Teaching and Learning

August 8-10, 2001
Madison, Wisconsin

This year the Annual Conference on Distance Teaching and Learning celebrates its 17th anniversary in serving as a forum for the exchange of information on distance education and training. In the past decade and a half, thousands of attendees have gathered in Madison to discuss key issues in using technology effectively. And, hundreds of speakers have shared their knowledge and experience through papers, presentations, workshops, and roundtables.

Throughout its 17 year history, the conference's major aim has been to increase our understanding of factors that contribute to effective applications. While technology provides an essential means to span geographic distance, the keys to success reside in human factors—in what people do to plan, design, and support distance learning applications. This year's conference is no exception. The 17th Annual Conference proceedings contains nearly 90 papers that address important human factors from several perspectives, including: learning environments, course development, innovative applications, instructional design, faculty development, evaluation and research, learners and learner support, planning and management, and teaching methods. The authors, as experienced distance educators or trainers, provide insights into how those factors contribute to successful outcomes and describe practical methods for implementing similar approaches in other settings.

Distance education has a rich history of more than a century of service in providing learning opportunities through technology. From the early correspondence courses of the 1880s to current use of video and the Internet, the distance education ideal has been to increase access to quality teaching resources by eliminating the barriers of place and time.

Today, distance education is moving into a new millennium, with expanded resources offering increased access to new learners. These new resources and audiences raise critical questions about how we preserve the historic ideals of quality and effectiveness in what has become a global eLearning marketplace. As the papers in these proceedings remind us, focusing on effective approaches, strategies and techniques goes beyond technology and market trends. It requires a commitment to human factors, an investment in human resources, and the human capacity to incorporate best practices into wise applications that meet learning needs and provide manageable and stable learning environments.

My thanks to the many people who have contributed to this conference over the past 17 years. I wish to particularly acknowledge Dr. Christine Olgren, Dr. Terry L. Gibson and Dr. Chere Campbell Gibson who served as previous chairs of this conference, and who continue to guide its aims through their dedication to the ideals of access and quality.

William Winfield
Conference Chair
University of Wisconsin-Madison

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❖ Information Sessions ❖

Examples and Tools for Building Web-Based Learning Experiences

Steven A. Ackerman, Director
Cooperative Institute for Meteorological Satellite Studies
University of Wisconsin-Madison

Thomas Whittaker
Cooperative Institute for Meteorological Satellite Studies
University of Wisconsin-Madison

In many fields interpreting images and maps is an integral part of learning a subject. The web can be an invaluable teaching tool for this purpose in that it allows students to assess their understanding and provides an opportunity for student and teacher collaborations at a distance.
The study of weather extensively uses maps of current weather observations to understand concepts. Particular problems arise in teaching introductory courses on weather because many of the students are non-science majors and often lack experience in graphical interpretation. To assist learning we have developed several web-based learning modules that are designed to improve student learning in specific problem areas. These tools, QuizImage and VISITview are freely available and will be demonstrated at the conference.

Introduction

In order to use effectively the web or any teaching tool, it is important to understand that people learn via different learning styles. Here we briefly present a simple learning diagram demonstrating how people learn. There are five stages in this learning diagram: input, reception, processing, practice, and feedback.

Input: The student receives a new stimulus that motivates her to learn. This stimulus can be self-generated or obtained otherwise, such as from a lecture or homework assignment.
Reception: This represents the student's filter to a given input. We do not receive all that is presented to us. Student motivation and the social and physical environments are factors that affect how much of a given input a student will receive. For example, loud noises during a lecture inhibit the student from receiving the full input of the lecture.
Processing: This learning diagram includes a reworking of the input by integrating reception with accumulated experiences and knowledge. If the student can tie the reception to a personal experience or to something he already knows, then he'll gain ownership of the material and will remember the information over a longer time.
Practice: We have often heard the phrase, "Use it or lose it." Practicing helps us to learn and advance in a topic, whether it be playing the piano, riding a bike, or doing math. This arrow in the diagram represents the student using reworked input. The more practice, the better, provided the practice is correct!
Feedback: Feedback is required to assure that the practicing is correct. Learning bad habits inhibits good learning. The feedback needs to be timely to avoid incorrect practice. The feedback provides a new stimulus and thus creates a loop in the learning diagram.

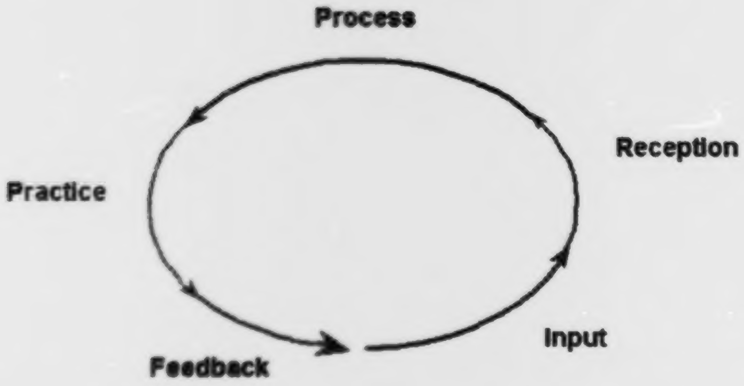

Figure 1. The simplified diagram represents the learning processes. The authors find this diagram useful in addressing topics that are difficult to teach.

Web-Based Learning Tools

This section discusses two easy-to-use and freely available tools that can be used to build components of a distance education course.

QuizImage

QuizImage is the name given to a small, yet powerful software tool that allows you, the instructor, the ability to quickly put together web-based, visual-identification quizzes for your students. Use this tool whenever you are having students identify features in one or more images or photographs. It is coded in Java to make the most use of the web. It is very useful for providing practice and feedback opportunities that support learning (see Figure 1)

QuizImage consists of two parts:

1) The QuizImage Builder is what you, the instructor, use to create the quiz by assembling the image(s), marking and naming the features, and saving them. Of course, a quiz can be edited later.

2) The applet, which is what the students run through their web browser. There are two versions of this:

A. QuizImage, which will ask students to find features within the image(s).

B. DiscoverImage, which will pop-up the feature names as the pointer is moved over them. You may also include hypertext links for more information.

In both cases, the QuizBuilder is the same; when you save the lesson, you simply choose whether you want to save a "Quiz" or a "Discover" type lesson. (You may actually save your working material as both—just specify different HTML filenames.)

QuizImage is extensively used by the authors in both lecture format and distance learning classes to provide practice feedback sessions. It is available at: http://www.ssec.wisc.edu/QuizImage/

VisitView

The Cooperative Institute for Meteorological Satellite Studies (CIMSS) has been working with the National Weather Service to develop methods of teaching/training using the Internet. The project is referred to as Virtual Institute for Satellite Integration Training (VISIT) (http://www.ssec.wisc.edu/visit/). VISIT is a joint effort involving NOAA-NESDIS Cooperative Institutes, including CIMSS, the National Environmental Satellite Data and Information Service (NESDIS), and the National Weather Service (NWS). The primary mission of VISIT is to accelerate the transfer of research results based on atmospheric remote sensing data into NWS operations using distance education techniques.

In support of VISIT, CIMSS has developed VISITview, a teletraining and real-time collaboration tool developed for the National Weather Service VISIT program to train forecasters (http://cimss.ssec.wisc.edu/goes/visit.html). It also can be used for any non-commercial application where image animations, zooming, colorizing, and the like are needed. It uses an integrated whiteboard/blackboard and a chat function to connect instructor(s) to many students. It also includes page-by-page quizzes and external links.

VISITview is used to support both lecture-based and distance education courses. We will demonstrate it during the conference, including how the tool can be used to teach weather or art.

Biographical Sketches

Steven A. Ackerman is Director of the Cooperative Institute of Meteorological Satellite Studies, a collaboration between the University of Wisconsin, NOAA and NASA. He is also a Professor in the Department of Atmospheric and Oceanic Sciences. His primary research interest is in energy transport within the atmosphere, particularly with regard to processes associated with global change. He received the Chancellor's Award for Distinguished Teaching in 1999. He was a recipient of a Lilly Teaching Fellowship in 1996. He was inducted as a Fellow in the University of Wisconsin-Madison Teaching Academy in 1995. He served as chair of the Academy in 1999.

Address: Space Science and Engineering Center
University of Wisconsin-Madison
1225 West Dayton Street
Madison, WI 53706
E-mail: stevea@ssec.wisc.edu
URL: http://cimss.ssec.wisc.edu/wxwise/ack.html
Phone: (608) 263-3647
Fax: (608) 262-5974

Thomas M. Whittaker is a researcher with the Cooperative Institute of Meteorological Satellite Studies. He has been a scientific programmer for over 25 years. He was one of the first educators to bring satellite weather animations into the classroom. He has developed a number of Java-based education tools that are used widely in the atmospheric sciences. He has developed the Java-based tools QuizImage and VISITview, which will be demonstrated during the presentation.

Address: Space Science and Engineering Center
University of Wisconsin-Madison
1225 West Dayton Street
Madison, WI 53706
E-mail: tomw@ssec.wisc.edu
URL: http://www.ssec.wisc.edu/
Phone: (608) 262-2759
Fax: (608) 262-5974

Online Testing in Distance Education

Tricia Ahern
Online Testing Coordinator
Pace University

Background on the Pace University/NACTEL Program

Pace University, in collaboration with CAEL (The Council for Adult and Experiential Learning) and the NACTEL partners (Citizens Communications, Verizon, SBC, Qwest, CWA (Communications Workers of America) and IBEW (International Brotherhood of Electrical Workers of America), has developed a degree that is completely online. The Pace University/NACTEL program was designed to create an industry standard Associate Degree of Applied Science in Telecommunications. This program is offered to current and potential company and union members throughout the United States. Development of this program began in the Fall of 1998 and five pilot courses were taught in the Spring of 1999. Currently, nineteen instructor led courses are offered completely online.

Pace University was one of twenty-nine universities awarded FIPSE funding as part of the LAAP (Learning Anytime Anywhere Partnerships) program in 1999. This funding provided resources for work in three areas: enhanced student support services, enhanced mentoring and **secure online testing**. Work in the area of secure online testing has resulted in a fully operational **proctoring system** that was established by Tricia Ahern, the current Online Testing Coordinator. Tricia has developed this program and continues to oversee it on a daily basis.

The Challenge of Testing in an Online Environment

Secure testing in distance education is a major concern of accredited colleges/universities everywhere. Pace University is an accredited institution and this degree program carries academic credit. Therefore, the issue of periodic student verification is very important when the student is required to take an examination. However, this task becomes a bit complicated when the students who are participating in our program are dispersed in various locations throughout the United States. How do we know for sure if a student in our program is actually the one completing an examination without the use of resources that are not permitted or assistance from another person? This becomes quite complex when we cannot directly monitor the student while he or she is taking the examination.

There are numerous methods of assessing students in an online course. However, this will vary depending on the delivery method of the course. The students in the NACTEL program access their course via a courseware program that the university has adopted. It is called Blackboard CourseInfo. Another similar courseware on the market is WebCT. Essentially the purpose of these packages are similar, however, differences do exist between them.

Assessments incorporated into a course offered though a typical courseware package such as Blackboard can be broken down into the following:

- Formal
    - Quizzes
    - Cumulative exams (midterm, final)
    - Submission of homework assignments
    - Projects (individual and/or group work)
    - Lab assignments and reports
    - Research/ term papers

- Informal
    - Participation in class discussion board
    - Email responses
    - Responses to questions posed in a chat session

The formal types of assessments such as quizzes and exams can be easily developed within Blackboard's assessment area. Various types of objective and essay questions can be created. The objective questions can be automatically graded and recorded within the online grade book that is incorporated into Blackboard. Questions can include html formatting, multimedia and links to websites. Quizzes and exams can be password protected, timed and created from a question pool. In addition, instructors can decide whether multiple attempts are allowed and if detailed results are shown to the student upon completion.

However, the assessment area in Blackboard at this time is still very limited. Other useful assessment features that would help make this area more effective are:

- Interactive questions (hot spot, drag and drop)
- Spell Checker
- Partial Credit
- Ability to enter mathematical symbols/functions
- Greater storage for essay type questions
- Randomization of both questions and answers
- Break down into 'blocks' to submit answers
- Submit question by question
- Branching
- Email sent upon completion
- Restrict leaving exam – 'secure browser'
- Weighting grades

A piece of testing software, Question Mark Perception does provide the above features. This is not a courseware program, but could be used independently for online testing purposes.

The Development and Incorporation of a Proctoring Program

In the hopes of providing validity and security to any assessments offered online, a proctoring program was established in the fall of 1999. Over the past two years, we have worked on developing and expanding this program throughout the NACTEL program as an affordable means of verifying student identity and ensuring that the students adhere to certain guidelines when taking an examination. This program provides a solution that is in keeping with the asynchronous mode of instruction.

The proctoring system incorporates designated proctors to supervise and administer any major examinations throughout the students' program at Pace. The assistance of a proctor enables us to verify that the person who completed the assessment followed all necessary examination guidelines and is actually the individual receiving credit for the course.

Students are required to obtain their own proctor. A proctor must be a reputable person who is responsible for administering and supervising any major examinations that a student is required to take throughout their program. The students are provided with a list of criteria to help them determine whether a person would qualify as a proctor in our program. This list has been modified and expanded over time to include the following:

- Supervisor
- Company Resource/General Manager
- Corporate Instructor
- Union Representative/Steward
- Company President/Vice-President
- Principal or Superintendent of an Educational Institution, either public or private
- Official Testing Service of an Accredited University or College
- Certified College, High School or Elementary Instructor
- School Guidance Counselor
- Librarian
- Military Educational Officer
- Clergy
- Law Enforcement Officer
- Official Learning/Tutoring Center

In order to be approved as a proctor the person **cannot** be a relative, student in the NACTEL program or a co-worker. From the beginning, notarization of the proctor's signature was required before official approval could be given. We have eliminated the need for notarization if the person is already approved as a proctor in our program or if the person meets the following criteria listed above: Official Testing Service of an Accredited University or College or Official Learning/Tutoring Center. However, they are still required to go through the application process and return a signed form.

After a proctor has been identified, Pace University will approve and record the final selection in the proctor database. We have worked on this database to improve the features and functionality of it. The current database enables the applications to be processed and tracked in a more timely and efficient manner. It also allows for quick and easy communication to the proctors and students when it's time to distribute the proctored exam information and passwords. All the necessary procedures and forms for the proctoring program can be accessed online by going to the following website: http://support.csis.pace.edu/nactel/program/proctoring.cfm.

Evaluation of Proctoring Program

In evaluating the proctoring program, we have been using surveys. Beginning with the Early Spring 2000 semester, all proctoring surveys were put online. With the help of IOTA, an outside evaluator, the surveys were slightly revised and made available using a direct link to access and complete the survey. Since then, IOTA has been working with us to improve the look of the surveys and to monitor the results of them. As students and proctors complete the online surveys, the results can be quickly accessed. Upon completion of a survey, which is usually about two weeks, IOTA creates a report based on the responses and sends that to us to review.

Overall, the responses we receive are quite positive. Initially, any negative comments about the proctoring program included not knowing about this requirement prior to entering the NACTEL program, questioning the need for this requirement and trying to find someone willing to serve as a proctor. As time went on, those negative comments seemed to lesson. We then began to hear more about the actual examinations. Students were having difficulty scheduling a time to take the proctored examination and also losing their Internet connection while taking an examination online.

In response to students concerns, we did try to accommodate the scheduling issue beginning with the Late Fall 2000 semester by extending the exam week from the current seven days (Thursday to Wednesday) to ten days (Thursday to Sunday), thereby giving them an extra weekend to complete their examinations. Several students did comment on how this helped them in scheduling their exams with their proctors. However, beginning with the Late Spring 2001 semester we returned to the initial seven-day week. In extending the exam week, we ran into the problem of final exams given during week fifteen being returned very late and thereby affecting the submittal of final grades. We've also tried to minimize the issue of students losing their Internet connection during an exam by providing them with ping software in which they are instructed to download and activate prior to beginning their examination. The amount of students who need to have their exam reset because of a lost connection seems to have decreased since this. However, there is still the occasional student who does lose his/her connection.

Conclusion

As concerns or problems arise with the proctoring program, we'll continue to evaluate them to see what can be done. Our initial goals in addressing the issue of secure online testing were to provide an affordable means in which we could verify the identity of the test takers, keep in line with the asynchronous mode of learning and make it as minimally intrusive as possible. We believe that we are doing this and realize that it does in fact work.

Biographical Sketch

Tricia Ahern is currently the Online Testing Coordinator for the Pace University/NACTEL program. Pace University has developed a fully functional Proctoring Program that has been incorporated into the Pace/NACTEL program. Tricia has spent the past two years developing and integrating this successful Proctoring Program as a low-tech, low-cost solution to the Online Testing problem that most universities face. Tricia is also an adjunct professor in the Computer Science and Information Systems Department. She has taught online courses at the graduate level. In addition to this, she occasionally teaches Internet workshops for teachers through the Pace Computer Learning Center.

Address: Pace University
1 Martine Avenue Room 416A
White Plains, NY 10606
E-mail: tahern@pace.edu
URL: http://csis.pace.edu/nactel
Phone: (914) 422-4445
Fax: (914) 989-8602

Skills and Expertise for an Effective Online Distance Education Instructor

Mohamed Ally, Ph.D.
Associate Professor
Athabasca University

In the conversion process from traditional classroom based delivery to online distance education, the instructor role will change drastically to function effectively in the online environment (Ally, 2000). The instructor will become a facilitator of learning by managing, coaching, supporting, and advising students. In the distance education mode the student and online instructor are not physically present in the same location. As a result, the online instructor has to use strategies to compensate for the lack of face-to-face contact. Depending on the geographic distribution of students, the online instructor can use synchronous or asynchronous communication tools to form a good first impression online, to persuade students to meet course requirements, to reach out to students to facilitate learning, cater for the different learning styles, provide feedback to learners, and provide content expertise to promote learning.

Impression Formation in Online Learning

The online instructor has to make a good first impression to establish credibility and to gain the respect of students. The online instructor has to use strategies to project a good first impression since there may be no face-to-face contact in online courses. Some ways for forming first impression in an online environment are: act professionally when communicating with students, communicate at the level of the learner, and establish course and instructor expectations at the start of the course. The online instructor may also form first impression of students. Impression formation is the process of forming impression of others based on information received and existing schema (Baron & Byrne, 2000). As humans, we use available information to form impression of others. The online instructor should be careful not to introduce biases when forming first impression of students. For example, the online instructor should not use names or location to form impression of students.

Persuasion in Online Learning

Because of the lack of human contact, the online instructor has to motivate students to successfully complete the course. Hence, the online instructor has to be a good persuader to get students to complete course requirements according to the prescribed standards. Persuasion is the process of changing others' attitude (Baron & Byrne, 2000). In online learning, the role of the online instructor is to change students' attitudes so that they can successfully complete the course. In order to be persuasive, the online instructor must establish credibility, show that he or she is an expert in the field, use two-sided arguments for sensitive topics, and arouse the emotions of students (Baron & Byrne, 2000). The online instructor can establish credibility by providing information on his or her background, expertise, research interests, etc. using synchronous and asynchronous tools. The online instructor can show that he or she is an expert in the field by providing personal examples, by referring to research that is being conducted, and by introducing current and relevant materials in the course. Two-sided arguments on topics can be presented by the instructor or by student teams as a method go get students to think about a topic or area so that they can form an opinion. The emotions of students can be aroused by using real life examples or by bringing an expert in the field to challenge students.

Facilitating Learning

The online instructor has to facilitate learning by role modeling behavior and attitudes that promote learning, encourage dialogues, and use of appropriate interpersonal skills. As a facilitator, the online instructor has to set the mood and tone of the course (Addesso, 2000). In face-to-face contact between the instructor and students, there are many nonverbal cues and gestures that help in the communication process. However, in an online environment where there is no face-to-face contact, the instructor needs to compensate for the lack of nonverbal cues by appropriate modeling and using interpersonal skills. For example, the instructor can use a conferencing tool to post comments and respond to students' questions. The instructor should model appropriate behaviour by posting sample comments so that students know what is expected in their contributions. The instructor should also use language that communicate and evoke emotions in the conversation. Appropriate emotional icons (emoticons) could be used to communicate feelings and gestures (Hiss, 2000).

Catering for Different Learning Styles

An effective online instructor must recognize that students have different style when learning and some students prefer certain style than others. As a result, the online instructor should use techniques that will satisfy and develop the different learning styles. There are many learning style instruments that are used to determine students' learning styles. The two most widely used in education are the Kolb Learning Style Inventory (1984) and the Myers-Briggs Type Indicator (Myers, 1978). The Kolb Learning Style Inventory (LSI) looks at how learners perceive and process information while the Myers-Briggs Type Indicator uses dichotomous scales measuring extroversion versus introversion, sensing versus intuition, thinking versus feeling, and judging versus perception. Kolb (1984) suggests that there are two components that make up students' learning experience.

The first component in the LSI, perceiving, is the way students perceive and absorb the information around us. This can range from concrete experience to abstract conceptualization. Concrete experience relates to one's preference to learn things that have personal meaning in life. The second dimension of perceiving is reflective observation. Students who prefer this style like to take the time to think and reflect on the learning materials. The second component, processing, is related to how one understand and process the information that is absorbed after perceiving the information. Processing ranges from abstract conceptualization to active experimentation. Students who have a preference for abstract conceptualization like to learn facts and figures and like to research new information on different topics. Students who have a preference for active experimentation prefer to apply what they learn to real life situations. They like to try things and learn from their experience.

The online instructor should include activities for the different styles to allow learners to experience all of the activities. Concrete experience learners prefer specific examples in which they can be involved and they relate to peers and not to people in authority. They like group work and peer feedback and they see the instructor as coach or helper. These learners prefer support methods that allow them to interact with peers and obtain coaching from the online instructor. Reflective observation learners like to observe carefully before taking any action. They prefer passive delivery methods and see the instructor as the expert. They tend to avoid interaction with others. Abstract conceptualization learners like to work with things and symbols and less with people. They like to work with theory and to conduct systematic analysis. Active experimentation learners prefer to learn by doing practical projects and group discussions. They like active learning methods and like to interact with peers for feedback and information. They tend to establish their own criteria to evaluate situation and things. The online instructor should provide opportunities for learners to learn by discovery.

Feedback in Online Learning

Timely feedback is important in online learning to maintain presence in the learning process (Bischoff, 2000). The online instructor has to provide timely feedback to learners, adapt to the learner needs, and be flexible for unanticipated problems. Since there is minimal or no face-to-face contact in online learning, students should be motivated on an on-going basis. The online instructor has to contact students on a timely basis to make sure students are active in the course. Motivating students can be done by re-assuring students what they are learning is beneficial and then challenging students by suggesting additional learning materials. The online instructor also has to make students feel comfortable and show enthusiasm about the course materials.

Promote Active Learning

Since online materials are presented on a computer screen, most courses require students to sit at the screen and read the materials for the online course. However, there must be adequate strategies to allow learners to apply, practice, and reflect on the materials. For example, students can be asked to complete a hands-on project and they could do an online report on the challenges and outcomes of the project. Students can also be asked to summarize online information in the form of graphic outlines and to present these online for other students to review and critique.

Be an Expert in the Field

In addition to being a facilitator of learning, the online instructor should be seen as an expert in the field. The online instructor must have the content expertise to answer students' questions and solve content problems. The online instructor solves content problems by keeping up to date in the field, interpreting learners' questions, communicate at the level of the learner, provide remedial activities, and conduct follow up on help provided.

Advising

As students complete their studies in the online courses, they usually encounter personal problems. The online instructor has to acknowledge the personal problems and, in some cases, address the personal problems. When addressing personal problems, the online instructor should establish an open and trustful environment. This will allow the instructor to recognize the personal problems, assess personal problems, and provide appropriate intervention to solve personal problems. If the online instructor cannot solve students' personal problems, the students should be referred to a professional counselor.

Conclusion

The online instructor must be prepared to function in the online environment where there is minimum face-to-face contact between the instructor and the student. The online instructor must be able to motivate students and facilitate the learning process so that learners can successfully complete the course. Also, the online instructor must form a good first impression and use appropriate impression management strategies when interacting with online students. The online instructor must also be able to persuade learners to successfully complete the requirements for the online course. More research is needed to determine how students behave in the online learning environment and what strategies can be used to promote learning in light of these behaviours.

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Mohamed Ally is an Associate Professor in the Master of Distance Education at Athabasca University. He teaches graduate courses in distance education and is involved in research in distance education. His research interests include identifying competencies for staff in different roles in distance education and investigating support mechanisms for staff and students in distance education.

Address: Athabasca University
1 University Drive
Athabasca, Alberta
T9S 3A3, Canada
E-mail: mohameda@athabascau.ca
Phone: (780)675-6406
Fax: 780)675-6170

Online Odyssey:
Staying Afloat in an Online Course

Molly Herman Baker
Baker Consulting
(formerly of Western Illinois University)

Sarah Stark
Director of Instructional Technology
William Rainey Harper College

Embarking on the teaching of an online course involves multiple types of tasks for the instructor. The actual design and development of the online course, for example, could be handled individually or with the assistance of a team of development support staff; by using a course development tool such as Blackboard or WebCT or by creating an original interface and course structure. Many valuable sessions were offered at the 17th Annual Distance Teaching and Learning Conference on how to design and develop high-quality online courses, including many tips for designing self-regulated learning activities directly into course requirements. However, the actual teaching of online courses has its own set of challenges and opportunities. "Staying afloat" while teaching an online course, especially the first time around, can be a daunting task. This session/paper focuses on some of the unique faculty tasks associated with teaching a course entirely online, although many of these strategies work well when teaching Web-enhanced ITV courses to distance students, as well. Both presenters have taught many Web-enhanced and online courses and in the process, developed dozens of strategies to support self-regulated learning, enhance student satisfaction with learning online, and make the experience of teaching online manageable and rewarding for the instructor. Demonstrations and a question and answer session were also included during the live session.

Getting Ready for Success

It is our experience that students who are more self-regulated are more likely to finish the course and rate the online learning experience positively. Concerned about students who have not finished or found the learning experience stressful, we have designed some structures that we believe encourage self-regulated learning for those who are "less inclined" and therefore, more at risk. For example, we send in the regular mail a precourse letter 2-3 weeks before the class begins to help students get ready. An electronic version of the letter is also posted for late registrants. This letter:

- Establishes a friendly first impression of the faculty member teaching the course
- Provides immediate contact information for students who have questions or concerns
- Prepares the students for any technical matters that need to be attended to before starting the course (computer capacity needed to take the course, procedures for securing Internet access, downloading software, etc.)
- Invites them to an optional face-to-face gathering to meet the instructor and other students
- Asks them to send a picture of themselves for a "Meet the Class" section of the Web site
- Points them to the Getting Started activities at a specific URL for the course

Since the primary course Web site is password-protected for registered students only (and the complete registration logins cannot be done until the first day of the term), a "public page" contains basic course information and the Getting Started activities so that students can get most of these tasks completed before the course is scheduled to begin. As directed by the precourse letter, students are asked to complete these activities by the end of the first week of the semester, earlier if possible. It is here where they can:

- Download needed software (Acrobat Reader) and plugins
- Read the Orientation to Online Learning document which includes tips from the instructor as well as former students who have given online learning advice as part of their final exams. They can also review the Online Resource Center provided for all online students at WIU.
- Complete the Who's Who form which provides the instructor with important student contact information and prior knowledge/experience data pertinent to the course content and students' computer configuration. Some of this information is used to create the "Meet the Class" section of the protected Web site for all students to browse, and other parts are used to assign students to learning cluster groups and to assist the support staff and instructor in providing technical support to students throughout the course.
- Assess their computer skills that will be needed for the course, and use the instructions to practice the skills that are needed if they don't have them already. It's amazing how many students who don't have adequate computer skills sign up to take an online course!
- Read the various tracks available within the course and submit their choices to the instructor.
- Establish their login on the course discussion board (instructions provided here).

Hence, by the time the first week of the term is over, almost all of the students have completed these activities so that they are ready to begin the course itself. The instructor is familiar with the makeup of the class, has met enough of them to feel "connected" to them as a group, and knows which tracks the students have chosen to pursue.

Promoting a Positive Climate

Learning online can be a solitary experience that makes some students feel isolated and unsatisfied. Online courses can also contribute to the instructor feeling "estranged" from the student contact he/she is accustomed to enjoying with his/her face-to-face students. We have found that a variety of structures can minimize these feelings of isolation without creating too much additional work on the part of the class participants. For example, regularly scheduled chat office hours each week provide an opportunity for students to have live contact with the instructor. Weekly scheduled discussion topics are carried out on the discussion board, with students' sharing the responsibility for leading the discussions (orientation provided). Of course, these discussions promote learning of the content, but they also promote sharing and help the students get to know each other. It is important for the faculty member to participate in these discussions enough so that the students feel his/her presence without being so involved that other student involvement is minimized.

We also assign students to small learning clusters with a set of instructions and expectations for interacting within the cluster group. Depending on the course, the instructions may direct them to collaboratively construct assignments relevant to the course objectives, to use each other for formative evaluation of individual assignments, or to serve as a computer support group for each other. Next, we create a section of the password-protected Web site called "Meet the Class." This section holds the students' pictures (optional), their current occupations and email addresses, and their home communities. Our students especially use this section once they are assigned to their learning cluster groups, and like having access to a place where they can get a feel for who is enrolled in the class and how far flung they all are. Finally, the instructor communicates with the entire class via e-mail once a week. These communiqués are very brief, friendly, upbeat, "I'm thinking of you" messages…usually a funny electronic card, an interesting resource that was recently discovered, a tip or reminder of something the students are working on that week, or some other light contact to help the students know they are not forgotten and that you welcome their contact.

Finally, students with novice-level computer skills or with less prior knowledge or experience with the course content often need more help along the way. Timely, supportive responses to these requests are very important to retaining these students and helping them keep from falling too far behind. At WIU, we have a toll-free technical support line and a technical support e-mail address. The support staff attempt to reply to student calls for help within 24 hours or less. Many students, however, begin by asking the instructor for help first. Since we are instructional technologists, we can often answer the easier technical questions and all of the course-related ones; but it is very important, for the instructor's sake, to direct referrals to the technical support staff whenever possible in a way that the student knows we are taking care of them. It is a good idea to ask the technical support staff to cc: their response to the student to the instructor as well (assuming it is electronic) so that the instructor can be aware the problem has been handled and so that he/she can learn how to handle the specific problem too…a great way to expand his/her skills!

We believe that these efforts to humanize the online learning experience reach out to those students with more social learning styles, and help all students stay connected with the ongoing progress of the course. Our student evaluations say that most students really like the cluster groups and the weekly contact with the instructor as a person!

Evaluating Course in Progress

Having regular contact with the students will give them the feeling that they are not isolated and that you care about their progress. But it also helps you keep tabs on how things are going with learning the course content. Monitoring the types of questions you and the technical support staff receive, for example, may suggest some added content that needs to be in the Orientation to Online Learning document in the Getting Started activities, or they might suggest alterations to course assignment requirements or deadlines, or the need for additional resources or information to support learning. By keeping a list of the questions and problems that are brought to our attention as the course progresses, we can make adjustments "on the fly," head off any problems before it's too late, and set plans in motion for making alterations to the course in the future. However, waiting for student questions may not always provide sufficient or timely feedback on the course's progress. We have built into each module a short evaluation form that the students complete when they have finished each module. We include at least two additional "how's it going so far?" evaluation forms during the first half of the course. And for the two courses our department teaches with no prerequisites (hence, many students are enrolled in these online courses for the first time), we require a formative, reflective final exam in which the students present their comments on how they learned to function in an online course, etc.…all valuable information for adjusting course orientation documents for future students. In addition, we share some of this feedback and our responses to it with the students so that they know we are trying to "listen" to their needs. We believe this encourages them to continue to share their ideas throughout the course without being unsure about our reactions.

Managing Assignments

Whether you teach online, on ITV, or face-to-face, managing assignments requires some kind of system to keep track of it all! When teaching online, however, all kinds of additional challenges can complicate matters. We have developed several methods to minimize them. First, it is very important to **post assignment specifications** in an easy-to-find place on the Web site. We have found that it helps reduce e-mail questions and general misunderstandings if these specifications are very complete (objectives, specs, criteria for evaluation, submission requirements) and include an exemplary sample assignment or two. In addition, the specifications for each assignment should include instructions for what electronic format to save the assignment in and for what to put in the subject line of the message that will have the assignment attached. We recommend saving word-processed files in RTF format so that all files can be read by the instructor's software of choice, regardless of what platform or word processor the students use. In the subject line of the assignment-sending e-mail message, we usually require the course number first, then a keyword designating the assignment (determined by the instructor, so it is the same for each student), followed by the student's last name (e.g., 510Proposal Baker).

Second, creating a conference/topic on the class **discussion board for assignment Q&A** encourages students to ask any assignment-related questions there, where the instructor can respond for all to see…again, reducing all of the potential individual, duplicate questions that can flood his/her email inbox. Third, most e-mail software programs today allow the user to **create mailboxes, filters and automatic responses**. It is well worth the effort to create an electronic mailbox for each assignment, a filter that will sort e-mail messages into those mailboxes if they have specific words in the subject line, and send an automatic e-mail confirmation that lets the student know the assignment has been received. The filter can be setup to put every message that comes in displaying a particular subject line into the designated mailbox (e.g., 510Proposal). The automatic confirmation that is generated when this assignment is filtered will reduce the student's anxiety that the instructor has received the assignment. No more "Dr. Baker, did you get my assignment?" messages either!

Finally, an **online gradebook** built into the Web site will provide an efficient means for the instructor to provide grades and feedback to each student. Our experience has confirmed the literature which suggests that online students are more likely to complete a course successfully when they must turn in more, smaller assignments and begin doing so in the first 2-3 weeks of the course. Prompt feedback on all assignments is also greatly appreciated!

Conclusion

Although well-designed online courses incorporate strategies within the modules that promote learning and learner satisfaction, it is some of the content-independent teaching strategies discussed in this paper that can make a big difference to the instructor in making the teaching of an online course more manageable and satisfying. These strategies go a long way toward establishing positive and productive relationships between the instructor and the students, thus enhancing significantly the learning environment. They make the day-to-day management of course materials efficient and reassuring to the students. They provide avenues for formative evaluation and course revision. And they establish a type of scaffolding that promotes self-regulated learning, a known characteristic of the most successful online learners. In other words, we hope these ideas have provided you with some useful ideas for you as you embark on the online teaching experience.

Biographical Sketches

Molly Herman Baker, Ph.D., of Baker Consulting has been involved with distance education as an instructional designer and faculty support professional, as an undergraduate and graduate professor, as an instructional design and distance education consultant, and as a trainer since the late 1980s. Most recently, she has developed and taught primarily graduate courses via satellite, compressed video, and the Internet to students earning their master's degrees in Instructional Technology and Telecommunications at Western Illinois University. Two of the courses she teaches are about teaching courses such as these. She has presented at the Madison Distance Teaching and Learning conference many times, and is scheduled to conduct a post-conference workshop this year on "Helping Instructors Find Their Distance Teaching Niche." She has collaborated with Sarah Stark many times to team teach distance courses, conduct professional development workshops for K-12 schools and higher education, and present at conferences.

Address: Baker Consulting
625 Compton Pkway
Macomb, IL 61455
E-mail: bakerphd@macomb.com
Phone: (309) 837-3663
Fax: (309) 836-2369

Sarah Stark taught K-8 for 20+ years, served as a Technology Coordinator and grant writer for the schools. In recent years, she has taught satellite, compressed video, and online courses for Western Illinois University's master's program in Instructional Technology and Telecommunications and contributed to the campus-based teacher education curriculum at WIU. She is currently serving as the Director of Instructional Technology at William Rainey Harper College in Palatine, IL where she supports faculty in the use of technology in their teaching, including distance delivery of community college courses. She co-presented post-conference workshops with Molly Baker in '98 and '99 at the Madison Distance Teaching and Learning conference on promoting interaction in distance teaching.

Address: William Rainey Harper College
1200 W. Algonquin Rd
Palatine, IL 60067
E-mail: sstark@harper.cc.il.us
Phone: (847) 925-6805
Fax: (847) 925-6037

Online Interaction: Just How Smart Are Starter-Wrapper Discussions in the Smartweb?

Brian J. Beatty
Doctoral Candidate, Instructional Systems Technology
Indiana University Bloomington

Curtis J. Bonk
Associate Professor, Counseling and Educational Psychology and
Instructional Systems Technology
Indiana University Bloomington

This study analyzed the on-line discussions that took place during an introductory educational psychology course in the teacher education program at a large Midwestern American university. Thirty pre-service teachers, from both elementary and secondary education programs, engaged in weekly asynchronous discussions focused on assigned readings in educational psychology. Implementing a socio-cultural approach designed to create a student-centered social learning environment, the course instructor structured the discussions using the starter-wrapper format. The starter-wrapper format required each student to assume the role of discussion starter and the role of discussion wrapper at least once during the semester. During other weeks, students post at least one message discussing concepts from the week's assigned readings. Henri's (1992) model for content analysis was modified to fit the needs of this study. A comprehensive coding was developed and used by two independent coders. Research questions explored the use of text and peer referencing in student discussions, the use of social cues in messages, and the level of cognitive processing evident in the messages. Most messages were evaluated as cognitively 'deep' even though there was, on average, more than one social cue per message throughout the discussion. Overall, the amount of peer referencing decreased throughout the semester and the amount of authoritative referencing increased throughout the semester, providing evidence that students were using warranted discussion skills more as the semester progressed.

Background and Literature

Sociocultural Learning

Vygotsky's approach to understanding learning as a social process (Vygotsky, 1978) has been used to design and implement many online learning environments that facilitate socially negotiated learning (Bonk & King, 1998). A social learning environment using Vygotskian sociocultural principles takes advantage of both student peers and the instructor to provide scaffolded instruction at various intellectual levels (Hedegaard, 1990; Vygotsky, 1978). Since the entire class learns in individual (and overlapping) zones of proximal development, one of the key attributes of this environment is allowing for each student to engage in discourse at the appropriate level. Requiring the entire class to engage in a weekly CMC discussion provides discussion posts on the same topic at a variety of intellectual levels, along with opportunity for further questioning in a participative, dialogic manner. The online social learning environment also engenders the development of social interactions and relationships that are different than the relationships that might be formed in a solely face-to-face class (Walther, 1996).

Use of Starter-Wrapper Discussions

Several recent studies have explored the use of CMC in both graduate and undergraduate educational psychology courses (Bonk, C.J., & Dennen, V., 1999; Hara, N., Bonk, C.J., & Angeli, C., 2000). These studies have explored effective student-centered learning environments created using web-based CMC tools. Some of these studies have used content analysis of discussion posts as a primary tool to understand student learning, and one study has reported the characteristics of on-line student interactions in a graduate level Educational Psychology class using the starter-wrapper discussion format (Hara, Bonk, & Angeli, 2000). Hara et.al. described the interactions and level of discourse they found in the weekly discussions among graduate level educational psychology students. Students were found to post messages that were cognitively deep, embedded with peer references, and lengthy in general. Hara et.al. also reported indications that this was a student-centered learning environment.

In the starter-wrapper discussions, each student was required to post at least once each week. As Harisim (1990) pointed out, and every instructor who has used on-line conferencing for class discussion is no doubt aware, students do not regularly participate in on-line discussions unless the course structure requires them to. Accordingly, in this class, their weekly participation contributed to their final class grade. Indeed, in this class, their weekly discussion participation was required, since there were no face to face meetings for most of the semester. An instructor invitation and a student 'starter' post began the discussion each week. The starter post was intended to provide a summary of the main concepts in the assigned reading for the week. The other students were expected to comment upon the most interesting aspects of the week's readings after the starter began the discussion. At the end of the week, another student was assigned the role of 'wrapper.' The wrapper post was intended to provide a summary of the main points of conference discussion for the past week. In addition to the weekly discussion invitation, the instructor also contributed an additional 'wrapper' post most weeks. This intention of this post was to model effective discussion weaving for the student wrapper. Some weeks, the student wrapper did not complete their task by the end of the assigned time period, so the instructor's wrapper post provided the final post for the week. (All student wrapper posts were eventually completed, though some were not completed until several days after the week ended.)

Method

We looked at five weeks of a twelve-week conference, analyzing student posts in both the Elementary and Secondary groups. We chose a regular pattern of weeks so that we could look for trends over time. At the outset, we looked at all the posts in the discussions, both students and instructor. We decided not to include the instructor's posts, starter's posts, or wrapper's posts in our analysis, since we were more interested in the non-programmed discussions of the students throughout the conference. (The format of the instructor's, starter's, and wrapper's posts was very similar from week to week.) This provided approximately 165 student posts (some students posted more than once to a particular discussion) to analyze, approximately 50% of the total for the course.

Unit of Analysis

The unit of analysis in this study varied for the different analyses we conducted. For the participation and surface vs. depth of processing analyses, the unit of analysis was an individual post. Each post was treated as a separate unit, regardless of by whom it was posted. An exception to this was made in the case of several early posts that were clearly identical repeating posts, posted in error. Repeated posts were coded once only.

The entire message as a unit did not provide the level of granularity we desired for the other analyses in this study, however. For the amount of referencing (both text and peer referencing) and amount of social cuing analyses, we needed to count each occurrence of either a reference or use of a social cue. As our analysis progressed, it became obvious that one student post could contain multiple references to texts and peers as well as more than one use of a social cue. Therefore, we decided to use each occurrence of either a text or peer reference or the use of a social cue as the unit of analysis for these measures.

Content Analysis

For this study, we chose to implement a modified version of the tool developed for content analysis by Henri (1992). The original tool provided for analysis of five key dimensions of analysis in online discussions: participation, interaction, social cues, cognitive skills, and depth of processing. We decided to look specifically at Henri's dimensions of participation, interaction, social cues, and depth of processing. In-depth processing occurs when learners critically evaluate information, organize it conceptually, and compare and contrast it with previously held understandings. In addition, we also looked for patterns of student references to their assigned readings (text) or other authors. One of the important emphases in the course discussions, both online and face-to-face, was to develop in students the skill of supporting their own beliefs and thoughts with citations from authoritative sources.

Multiple Coders

In order to improve the accuracy and reliability of our coding, two researchers coded each message independently. Then, the researchers met to discuss the results. For the referencing (both text and personal) the coders found over 90% agreement. Social cue coding agreed at greater than 80%. Initially, the agreement on depth of processing was only about 60%. The two researchers discussed each post and reached consensus on over 95% of the posts. The remaining 5% of the depth of processing coding decisions were judged by an independent third coder.

Quantitative Analysis

The quantitative analysis consisted of several different analyses. One analysis used simple descriptive statistics to determine the pattern of student participation over the semester. We completed a word count for each post to determine the average length of each student post. Another analysis determined the ratio of deep to surface cognitive processing posts for each discussion. This provided a number representing the relative amount of deep processing compared to surface-only processing. Finally, the occurrences of social cuing or referencing (text or personal) were summed by post and averaged for each discussion. Comparisons were made for all three analyses (depth of processing, referencing, and social cuing) by time in semester, plotting the processing ratio or average number of occurrences by discussion week. In addition, a simple graphical comparison of all three analyses was made between the Elementary and Secondary discussion groups as the semester progressed.

Coding Guide

Each student message was coded along three major dimensions; depth of cognitive processing, the presence of social cuing, and referencing other texts or peers. In-depth processing occurs when learners critically evaluate information, organize it conceptually, and compare and contrast it with previously held understandings. This is thought to occur when learners translate new information into their own terms, for example connecting it to their own lived experiences (Henri, 1992, p. 130). Social cues are identified throughout a message, and reported as an aggregate number for each message. The social element of a conference message can be defined as any statement or part of a statement not related to the formal content of subject matter or the metacognitive process of the message author. Previous studies have suggested that the importance of social dynamics in computer conferencing cannot be ignored (Henri, 1992; Kuehn, 1994; Rice & Love, 1987; Walther, 1996). Referencing is defined as citing or referring to another source of content information, subject matter, or discussion participant. Text referencing may follow a traditional citation format, or may use a more informal approach, simply referring to a text or author without page numbers or year of publication. References to other discussion forum participants include both the name of the referred and the specific topic or statement that is being referred to.

Findings

Participation

Most students participated every week of the semester. Overall, student participation averaged 90%, with approximately two-thirds (20 of 31) of the students posting in each week of the study, and approximately one-third (10 of 31) posting more than once in at least one discussion. The number of words per message varied in the range of 300 to 500 words from week to week, with no distinguishable pattern over time. The posts in the Elementary discussion tended to be slightly longer, however, averaging 436.2 words overall compared to the Secondary discussion post average of 364.1.

Cognitive Depth and Social Cues

Most posts (77%) in both discussions contained elements of cognitively 'deep' thinking (Henri, 1992) even though there was, on average, more than one (1.4) social cue per message over the five weeks of discussion posts. On average, there were 19.2 posts each week that contained evidence of deep cognitive processing, and only 5.6 posts that seemed to contain only surface cognitive processing. The ratio of depth to surface messages varied from a low of 1.9 in Week 6, the midpoint of the study, to a high of 7.0 in Week 8. No significant or consistent differences were found in discussion depth vs. surface comparisons between the Elementary and Secondary pre-service teacher groups.

The use of social cues was consistent throughout the study. In each group, posts averaged more than 1 social cue throughout the semester, with a low of 1.21 social cues per message for the Secondary group week 6 discussion, and a high of 1.95 cues per message in the Elementary discussion of week one. It is very possible that the students were still using formal discussion patterns, with polite social openings and closings to posts, early in the semester. We did not specifically code for this use of social cues, however.

Referencing Authorities and Others

Overall, the amount of peer referencing decreased throughout the semester from an average of .70 references per message in Week 2 (the first week of study) to .53 references per message in Week 10 (the last week of study). The amount of text referencing increased throughout the semester, from an average of approximately 0.4 references per post in Week 2, to approximately 0.7 references per post in Week 10. This may have been due to instructor modeling or encouragement. The amount of both peer and text referencing was generally greater among the Elementary group than among the Secondary group.

Implications

The amount of text citation increased considerably, while conversely, the amount of peer referencing decreased consistently over the course of the semester. Perhaps this was due to the modeling of authoritative justification evident in instructor posts. Occasionally, we noted the instructor praising one or more students who had incorporated text citations into their own posts. It seems that a combination of scaffolding strategies can be effective in helping undergraduate students develop citation skills.

messages). It seems that undergraduate students are at least as capable and willing to use their cognitive skills in their posts as are graduate students. Another similar finding to Hara et al. (2000) is the decrease in the presence of social cues in messages over the course of a semester. Perhaps, as a semester progresses, students become more task focused and include less social cues in their posts, even though they may actually know their fellow students better than before. The overall consistent use of social cues throughout the semester (average of more than one per post in each week, in both groups) may be an indicator of social interaction expected in a participative discussion, a characteristic of a sociocultural learning environment.

Further Research

Further studies could explore the relationship between social cues and metacognitive statements, explore whether the on-line discussions help the development of a sense of community, and explore more comprehensively the combination of face-to-face and on-line interactions and content-focused discussions that occur in distributed learning environments. Research such as this is important since it extends previous findings with graduate students to the undergraduate arena. If we can find ways to bolster the intellectual interactions of students online, no matter what their domain or level, such research will contribute to improvement of pedagogy in the use of WWW for education.
*A full paper with tables and figures is available. Please send your request to bjbeatty@indiana.edu.

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Biographical Sketches

Brian Beatty is a doctoral candidate in the Instructional Systems Technology department at Indiana University Bloomington. His areas of research interest include social interaction in online learning, content analysis of CMC discussions, and the use of assessments in varied online learning environments. He is also a Director of Course Development at Unext, creating online courses for academic and executive education programs. Brian holds an M.A. in educational technologies from San Francisco State University, and a B.S. in electrical engineering from Marquette University.

Address: 2706 S. McMillan Ct.
Bloomington, IN 47401
E-mail: bjbeatty@indiana.edu
Phone: (812) 355-6426
Fax: (812) 333-0545

Curt Bonk is an associate professor in the Counseling and Educational Psychology and Instructional Systems Technology departments at Indiana University Bloomington. Professor Bonk is also a core member of the Center for Research on Learning and Technology within the School of Education, and the president and founder of CourseShare.com. He has been a visiting scholar in Finland, Canada, and Australia, and is currently a Senior Consortium Research Fellow with the Army Research Institute. Curt holds a Ph.D. and M.S. in educational psychology from the University of Wisconsin-Madison, and a B.A. in accounting from the University of Wisconsin-Whitewater.

Address: 201 N. Rose Avenue, Room 400
Bloomington, IN 47405-1006
E-mail: cjbonk@indiana.edu
URL: http://php.indiana.edu/~cjbonk/
Phone: (812) 856-8353
Fax: (812) 856-8333

Online Instructional Strategies:
How Many Students Fit in an Online Course?

Gerry Bedore, Jr., Vice President
Socrates Distance Learning Technologies Group

Jody Goins, Owner
Indego, Ltd

How Many Students Fit in an Online Course?

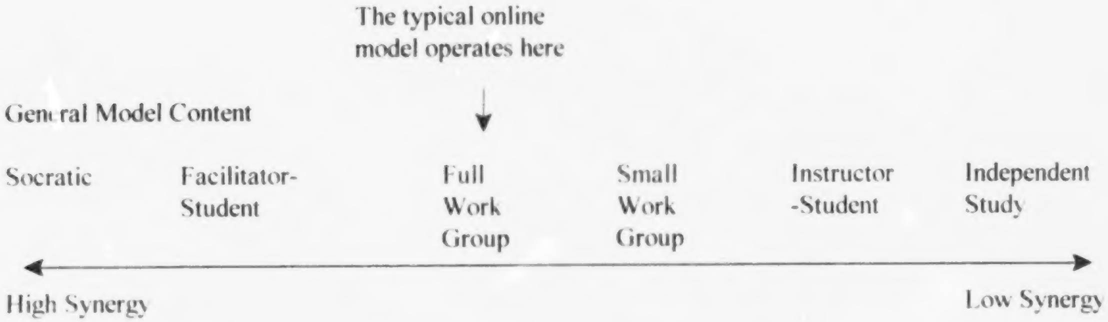
Asynchronous online learning models range from interactive learning to independent study. The factors that determine which learning model is appropriate for a given course and/or organization include the student's needs, economic requirements, infrastructure, resources, and the nature of the content presented. Each learning model has a different set of requirements in terms of the number of students that a class can support and remain "doable."

Learning models can be said to exist on a learning continuum as illustrated in Figure 1. The Socratic end of the continuum argues that a group combines knowledge, experiences, and thought processes to derive answers. At the Independent Study end of the continuum, the student is required to obtain knowledge and skills on an independent basis. Between these two ends of the continuum exists a mixture of the two extremes.

The learning continuum can also be viewed in terms of synergy created at each point on the continuum. The highest level of synergy exists at the Socratic end, with the lowest level of synergy existing at the independent student end of the continuum.

Figure 1.

The Learning Continuum



At any given point along the continuum the of number students that can be in a class changes. It is not uncommon to see 30 – 200 students in a class presented in an Instructor-student model. The ability of the instructor to interact with the students, or the students to interact with other students, is limited by time, the amount of material to be covered, and the role the instructor takes in the process. The level of discussion in this model is typically low or does not exist at all. The interactive online model is very different and must be treated differently in terms of the number of students, the tools used to achieve the learning competencies, and the role of the facilitator. The Interactive Online model is grounded in collaborative or "student centered" learning activities. The course design, the role of the facilitator, and the role of the students come together utilizing the life, work, and accumulated knowledge of the participants to produce the learning outcomes. The interactive online process takes theory/content (foundational materials) to application in one-step by utilizing the diversity of student inputs in a focused process. This process demands that the student's and facilitator maintain an active role in the learning that takes place. Inherent in this process is a very high level of discussion. Because high levels of discussion support the learning, the number of students that an interactive online process can support is optimal at 12 to 15 students. As the number of student's in an interactive online class increases beyond 15, the level of participation declines. At 20 student's in an online class, the discussion level can decline by as much as 50%.

Some organizations may need a higher student teacher ratios to support financial needs. In many cases, shifting from the Interactive online model to the Bounded interactive online model may be desirable. The Bounded Interactive model exists just to the right of the Interactive model on the learning continuum. The model remains highly interactive with the level discussion being slightly relaxed to accommodate the input by 25 to 30 students (optimal class for the Bounded Interactive model). Shifting from the Interactive online model to the Bounded Interactive model requires that the tools used within the course change relative to the interactive model. Examples of the changes include: slightly relaxing the discussion by closing up open-ended questions, using small work-group projects, using more report writing, or reducing the number of days per week that a student is required to participate in the learning process.

There are many things that can happen within a class to cause a shift in a learning model. Examples include: excessive drop/adds to a class, improperly designed course materials, and poor support. An online facilitator must be able to recognize and adjust within the learning process to keep the learning process from becoming stressed. Understanding the dynamics within a learning model, and how many students can be in a class, are key ingredients in being successful.

This session provides practical ideas and proven techniques for online education.

Biographical Sketches

Gerry L. Bedore Jr., MBA, is the Vice President for Socrates Distance Learning Technologies Group (DLTG) and the Faculty Trainer for the Art Institute Online (AiO). Active in distance learning for over ten years, Gerry has prepared thousands of faculty for teaching in the asynchronous online environment, guided institutions as they implemented successful online programs, and offered training and seminars coast to coast. For the last two years, Gerry has served as the consultant and developer for the Art Institute Online program. He provides support to mentors and faculty alike in order to offer students a consistent, quality online program.

Address: 465 W. Redwood Dr.
Chandler, AZ 85248
E-mail: bedoreg@aii.edu
URL: http://socrates.aionline.edu
Phone: (480) 802-4512
Fax: (480) 802-4467

Jody Goins, M. Ed., of Indego, Ltd. has been employed in distance learning since 1994. She has been a mentor for the AiO program since October 2000. Prior to founding Indego, Ltd., Jody establish two distance learning programs. She served as Director of Academic Outreach at Macomb Community College and Director of Distance Learning at The University of Toledo.

Address; 5523 Silvertown Drive
Sylvania, OH 43560
E-mail: jgoins@e-indego.com
Phone: (419) 885-7869

Starting Over From the Middle:
Constructing a Faculty Development Plan

Caryl L. Bender, Ph.D.
Instructional Design Specialist
Collegis/Brookdale Community College

Suzanne Craymer, Ph.D.
Senior Instructional Analyst
Eduprise

Brookdale Community College, founded in 1967 to serve the citizens of Monmouth County, New Jersey, offers associate degrees in over 50 programs and has a population of over 11,000 students. Recently, the college committed to the ambitious goal of offering online web-enhancement as an integral part of all courses. Web-enhanced courses enable learners to fulfill technology requirements and may prepare instructors to offer fully online courses as part of the New Jersey Virtual Community College Consortium. Out of approximately 1800 courses (including all sections) offered per semester, however, only nine courses are currently offered wholly online and thirty-seven courses have web-enhanced components. An additional eleven courses are being developed for implementation in 2001 or 2002. This comparatively low number surfaces despite hard work by the Brookdale team to provide quality faculty support including face-to-face technology workshops and opportunities to consult with experienced online instructors. To move beyond the stage where mostly Innovators and a handful of Early Adopters offer web-enhanced courses, the Brookdale stakeholders decided to assess the degree which all full-time instructors used technology and integrated it into their teaching. The assessment also asked instructors to identify barriers to technology integration. Based on the interpretation of assessment data, which confirmed the existence of Innovators and Early Adopters, a faculty development plan was crafted to encourage further early adoption as well as to begin the cultivation of the Early Majority through offering increased training opportunities, showcasing the achievements of other faculty members, and building the infrastructure for a mentoring program.

The Assessment Instrument

The instrument was based on the Engaged Learning/Technology Integration Instrument developed for use in K-12, which assessed performance in two major categories: engaged learning components (a constructive approach) and technology use. For the purpose of this study, only the technology section was used. This section was augmented by the inclusion of specific skills inventories related to online teaching and learning. The skills section asked respondents to assess their competency, using a Likert scale, in the categories of general tool software use; HTML editors; web course management software; scanning; graphics and other software; and copyright issues. Other sections included computer use, learning activities, and open-ended questions. In the computer use section, respondents rated how many hours they spent each week performing various functions on the computer. The learning activities section queried respondents on the computer-based activities they required learners to perform. The open-ended questions asked respondents to identify barriers to technology integration in areas of hardware and software, training, and resources. Instructors were also asked to delineate factors that would encourage or discourage the development of online content.

The survey was delivered to the division chairs and placed in the mailboxes of all 214 Brookdale faculty members by department personnel. Surveys were collected and reminders sent by instructors serving as the technology resource person for their division. As a result of this process, 98 faculty members submitted completed surveys for a response rate of 46%.

Presentation of Data

In regard to their computer skills, approximately 80% of the respondents indicated that they were quite comfortable with basic computer functions related to word processing. Fewer faculty members reported proficiency with advanced word processing skills and use of spreadsheets. About 20% of the respondents had created a basic web page using an HTML editor. Only 10-15% had experience with course management software (RCDDS or WebCT). Reporting on time spent using computers weekly, faculty indicated they spend the most time (mean = five hours per week) preparing teaching materials. Internet research and professional email each merited an average of four hours per week.

Responses to the section on learning activities indicated that Brookdale learners are most likely to be required to conduct Internet research (60%), create word-processed documents (54%), use email (46%), and use course specific software (34%). Fewer than 15% of respondents required learners to use simulations or utilize spreadsheets or databases to explore or analyze relationships between data. Only 5% required students to participate in online threaded discussions.

In response to the open-ended questions, faculty identified lack of time, limited compensation for development, and uncertainty about the ownership of online courses as barriers to developing online content. They also indicated concern about access to updated hardware and software.

Interpretation of Data

Everett Rogers (1995) describes diffusion of innovations as a process of communication in which members of a social system pass the innovation from one member to others by convincing them of its utility. Viewing the integration of technology with teaching as an innovation has provided authors with a theoretical framework for comprehending the spread of instructional technologies throughout an institution (Edmonds, 1999; Jacobsen, 1997; Geoghegan, 1994). Interpreted according to Rogers' framework, the data indicate that the success of instructional technologies at Brookdale depends on the Early Adopter category achieving critical mass.

Key elements of the diffusion model are adopter categories and critical mass. Adopters can be described in a continuum according to their level of innovativeness. Innovators will adopt an innovation first, represent only about 2.5% of the group, and are considered risk takers. Early Adopters comprise about 13% of the group and are generally regarded as leaders whom other adopters will follow. The Early Majority makes up 34% of the group and will only venture to adopt the innovation after watching others use it successfully. The Late Majority contributes another 34% of the group and will only adopt an innovation after it has become accepted practice. The Laggards are the last 16% of individuals in a group to adopt new innovations; they will actively oppose adoption and may never use the innovation. Critical mass occurs when enough individuals have adopted the innovation to make its further use self-sustaining. This point usually occurs when 15-30% of the social group has accepted the innovation and represents the transition from one group to another.

If the various technologies involved in online teaching are "unbundled" and considered as separate innovations, it becomes clear that some of these innovations (e.g. word processing) have reached critical mass while others (e.g. use of online course management software) are still in the early stages of adoption. This is indicated in the data by the graphs of the responses. Most of the graphs are skewed either positively or negatively. The distributions that are negatively skewed indicate innovations that have exceeded critical mass; nearly everyone has adopted them. Those that are positively skewed indicate only the innovators and early adopters have accepted them and the Early Majority is still waiting.

The two-step flow model of mass communication is described by Rogers (1995) as issuing from a source, flowing through mass communication channels, to opinion leaders, who pass them on to their followers. This model emphasizes that while mass media creates awareness of innovations, interpersonal networks are the most critical influence on individual decisions to adopt the innovations. As opinion leaders, the Early Adopters are critical in communication information about online education. The faculty development plan for Brookdale should focus on supporting and encouraging these Early Adopters in the adoption of online education, as they will informally influence others, the Early Majority.

The Faculty Development Plan

Recognizing that Early Adopters and the Early Majority have different needs, as indicated by the variety of answers given for open-ended survey questions, the faculty development plan divides Brookdale instructors into specific audience cohorts. It was drawn from tools training, pedagogy, and mentoring Eduprise deliverables and based on the Eduprise training plan template; the itself plan takes advantage of Brookdale resources such as the Center for Teaching Learning and Technology (TLT). Although the plan provides some training for Early Adopters, it places emphasis on making "new" technologies available to them through the TLT Center. Financial incentives are offered to the Early Adopters to participate in a mentoring program where they would assist faculty members in their departments with developing web-enhanced courses. However, during the first few mentoring sessions, a handful of Early Adopters reported that the faculty members in their departments showed little interest in instructional technologies. When taken in conjunction with the survey data, this reveals that members of the Early Majority still remain few and far between. Hopefully, this group will grow as a result of watching and listening to the Early Adopters as they use their financial incentives and release time to develop courses; the survey data illustrate that the perception of institutional support and commitment to online learning is needed to fully motivate this group. A technology newsletter will be initiated to build awareness in the majority of faculty of the uses of technology in teaching and learning. Despite waiting while institutional changes take their effects, training is being offered to members of the Early Majority. This training takes into account the emphasis on teaching held by this group by placing more stress on online pedagogy than on the technology itself.

Conclusion

Assessment data informed by models of communication and innovation have resulted in the construction of a faculty development plan, according to the Eduprise template, that targets the specific needs of the Early Adopters and Early Majority. When coupled with increased institutional support and the resolution of issues of ownership and compensation, Brookdale Community College will achieve its ambitious goal of offering web-enhanced elements in all its courses.

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Biographical Sketches

Caryl Bender has a Ph.D. in Curriculum and Instructional Technology from Iowa State University. With a background in research on technology integration, she is now focusing on designing faculty development programs to promote integration of technology by adjunct faculty.

Address: 765 Newman Springs Road
Lincroft, NJ 07738
E-mail: cbender@brookdale.cc.nj.us
Phone: (732) 224-2359

Suzanne Craymer

Address: 2000 Perimeter Park Dr.
Suite 160
Morrisville, NC 27560
E-mail: scraymer@eduprise.com
Phone: (919) 376-3443

Say After Me, "Change is Good": Switching Platforms for Web-Based Delivery

Marilyn Bergmann
Instructional Technology Coach
University of Wisconsin-Eau Claire

Cynthia Hofacker
Distance Learning Coordinator
University of Wisconsin-Eau Claire

In 1997, LearningSpace was installed on our laptops and we were instructed: "Learn to use it and teach the faculty." As rookies, we began the process of learning our first groupware package, getting faculty interested, setting up HELP documents, and providing training and support. Now, four years later, as seasoned veterans, we have Blackboard accessible through the WEB and have been instructed: "Learn to use it and teach the faculty." In the role of trainers/course developers, we face the challenge of making the transition from LearningSpace to Blackboard seamless for our College of Business faculty. Things are different than they were four years ago—more faculty are savvy and interested, there is a university-wide support system, and the concepts of developing a course within a groupware package are familiar to us. We know what worked and what didn't last time around.

One of our big lessons learned is that not all faculty embrace technology in the same way and thus they require different levels of support—or intervention. We know, for example, that no matter what we do, some faculty won't embrace technology at all. So be it. Beyond that small group, we know which of our faculty are dependent users: "You set up my course, input and organize my materials, and troubleshoot; I'll manage day-to-day interactions." We know which faculty are semi-independent users: "You train me, provide a little support now and then, but I'll handle organization, input, and day-to-day management of my courses." And we know which faculty are independent: "Give me the URL and leave me alone." In addition, we know which of those independent users will produce an excellent product and which will put together a disorganized hodgepodge. Knowing this and accommodating it saves time and effort.

Whether we are dealing with the most technologically savvy members of the faculty or whether we're dealing with the "let me know when it's ready" members, we have, over the course of the last few years, put together 10 rules for course conversion (Rules that apply in a move from the traditional classroom setting to a WBLS setting or from one WBLS setting to another, and which apply whether the course uses WBLS as its only mode of delivery or as a supplemental mode for a traditional or ITV class):

Rule #1: Don't Bury Yourself or Others in Background Information

When we were given the task of introducing LearningSpace, we thought we had to know its background. We searched for workshops and written guides (most pertained directly to Lotus Notes and only remotely to LearningSpace). We tried to understand server set-up even though that was not our responsibility. In our quest to learn how everything worked, we printed out every HELP document for faculty and students that existed within LearningSpace, compiling two huge binders full of documentation.

Once we knew the background, we tried to share it—ALL. We explained how LearningSpace related to Lotus Notes. We described the client and the WEB versions. We taught faculty how to work locally or on the server and how to replicate from the local to the server. We told them where our servers were housed, what they were named, how data was stored and backed up. They didn't care. They just wanted to use it.

Now, for Blackboard, the basic background information we offer is "UW-Milwaukee provides our server support." That's it. There's no separate client version. There's no more that faculty need to know.

Rule #2: Provide Simple, Limited Instructions at the Level Needed

That first summer in '97, before our faculty got directly involved, we took those two huge binders of documentation we had printed and spent weeks condensing and organizing the material. By the time we finished, we were down to a mere 100 pages of printed HELP documents to share with faculty. We gave workshops covering every button and every combination of buttons. There was no such thing as "knowledge on demand" or "just in time learning." Training the faculty was our responsibility and we were nothing if not thorough. We overlooked the fact that unless they had a reason to know everything, they would neither use the information nor retain it for very long. And they would become discouraged.

For Blackboard training, we ask faculty to attend sessions where they can receive from 2 hours to 2 days of instruction, based on their intended level of use. We will also offer some "quick and dirty" sessions prior to classes resuming in Fall for faculty with very limited needs, with considerable groupware experience, or with a vague interest in seeing what this is all about. As for Documentation, we provide a single sheet that explains how to access Blackboard. All other documentation is on-line; we encourage faculty—and students—to access it and print it out as needed. We still develop on campus documentation to supplement that of the product developer, but even that is housed on-line.

Rule #3: Dive in. Training Has a Short Shelf Life

With LearningSpace, we not only attempted to thoroughly train people up front, we did it well in advance. We also expected faculty to develop materials in all areas of LearningSpace before using it with students. They worked in "practice classes" for workshops and waited some time before the Client was operational on their own computers. As a result, they suffered from information overload and retained little of what they had been taught when the students actually "arrived."

With Blackboard, faculty still train in a "practice class," but we encourage them to go to the training that suits their needs. If they have no intention of doing assessments in the near future, they don't attend that workshop. Most faculty now have their own class set up immediately. And, because Blackboard is totally WEB-based, faculty can work in their own classes from any site with Internet access.
We've also learned to provide "generic students" in each class to allow faculty to practice such activities as setting up teams and receiving and returning documents without having to wait for the actual students.

Rule #4: Build on Organizational Structure That Already Works

LearningSpace offered five databases to fill. We stressed the need for organization. We debated what belonged in which database. The Schedule was referred to as "the Roadmap," but just how much detail should we expect on a roadmap? We even spent time deciding among the alternative terms LearningSpace offered: Should the Schedule house modules? units? days?

Now, for those moving from LearningSpace to Blackboard, it is really quite easy to keep the organizational structure they've already created (Table 1). For those using groupware for the first time, our best advice is 1) look at how you currently organize your course—on paper, 2) look at how other faculty have organized their materials on-line, 3) maintain as much of your original off-line organization as possible.

Rule #5: Don't Duplicate Effort

Actually, Rule #5 was not a rule we violated when we began using LearningSpace; we couldn't. We literally could not find anything that had been done prior—either on our campus or nearby—that we could model. But as more and more users came on board, we shared layout ideas and, sometimes, actual documents. In our roles as course developers, we have often pulled a document, such as an Activity Layout from one class and used the skeleton in another (Table 2):

Rule #6: Envision the Big Picture, But Don't Necessarily Complete It All at Once

As we stated earlier, in LearningSpace, we tried to go for development of the whole course before the semester began—posting all materials needed from day 1 to final exam and using every aspect of LearningSpace. Almost immediately, we learned that this was unrealistic. Very few of us are ready for every detail of the semester by day 1. We also learned that some faculty didn't need—or want—to use the whole product. One faculty member uses just the Assessment/Schedule part of LearningSpace to prepare his students for the SHRM certification exam. Another uses just the CourseRoom to engage his students in threaded discussions. Several use just the MediaCenter to house documents.

Table 1: Organizational Structure (From LearningSpace to Blackboard)

Materials in (LS):	**Move to (Bb):**	**Examples**
Schedule (Start Here)	Course Information	Syllabus; Policies; Groupware tutorial
Schedule	Assignments (set up folders to hold the activities just as the modules/units held them in LS	Reading assignments: Discussion assignments; Quizzes—whatever students have to DO to move through the class
Media Center	Course Documents	Articles, PowerPoint, Exam Reviews
CourseRoom (Discussions)	Communication: Discussion Board	Seeded discussions; student initiated discussions
CourseRoom (Assignments)	Student Tools: Drop Box	Student assignments submitted for Grading
Profiles	Communication: Student Roster & Student Pages	Class list; Student information
Assessments	Assessments	Posted for students in Schedule (LS) and in Assignments (Bb)

Now we are encouraging individuals—especially new groupware users—to plan out the first unit or first few weeks and to try one or two aspects of Blackboard first. BUT, we also encourage them to look ahead: Set materials up in such a way that the next units or the rest of the semester can be added following their already established format. Consider how they might expand their use of Blackboard in the future. Even consider the feasibility of the course for a total on-line presentation.

Table 2: Activity Layout

Activities for MBA Accounting				
Outcomes:				
Assessments:				
Unit	Unit 1:	Unit 2:	Unit 3:	Unit 4:
Team Discussion				
Project Assignments				
Individual Assignments				
Resources Readings Web Sites				

Rule #7: Modify, Don't Recreate

If an activity worked in the classroom, it will likely work in groupware. But don't assume it can be used without modification. For example, a topic that generated a great class discussion among 40 students for 40 minutes cannot simply appear as a seeded discussion in groupware. To generate a good discussion there, the instructor needs to 1) break the 40 students into teams, 2) require each student to make a specific number of postings spread out over a number of days, 3) take an occasional active role in the discussion, and 4) assign students to summarize their team's discussions. No question, the planning of this kind of on-line discussion consumes more time than planning for a classroom discussion, but once the plan is established, it can be used again and again (remember Rule #4).

Likewise, if an activity worked in LearningSpace, it will likely work in Blackboard with little need for modification. Sometimes it just takes a little ingenuity. LearningSpace, for example, allows for private discussion between a student and teacher. Blackboard has no such option, but a student can simply click on the instructor's name under Staff Information and send email. One instructor wanted private discussion with students but she wanted all course-related documents to remain within Blackboard. We set up teams of one and titled each team: "Private Space for student's name here."

Rule #8: Test the Student View

Testing the student view was essential in LearningSpace because of the client and web versions, but the test is still worthwhile. Instructor views and student views are not always the same. In LearningSpace, the instructor can make documents Private to Instructor; in Blackboard, the instructor chooses a yes/ no option to "Make Available Immediately." Such documents will be visible to students only when the instructor gives them access. A weekly look at the student view will help the instructor remember what changes are necessary. In Blackboard, instructors have such options as an "Add Forum" button for the Discussion Board; students do not. Taking the time to compare instructor and student views can save the embarrassment of asking students to complete activities or do readings they can't even access.

Rule #9: Print Out, Write Down What You Did

Most educators are task list people, so we're used to writing things down. We're encouraging you to write down not only what you plan to do, but what you did. Uniformity and organization are keys to helping your students move comfortably in a web-based learning system. If, on the Unit 1 Assignment page, you use green for references to articles found in Course Documents, use green in all subsequent units. If you organized the Assignments for Unit 1 so that the readings were listed first, the discussions second, and the individual work third, keep it that way in all subsequent units. The problem is trying to remember what you did in the last unit. It works best to create your first unit; then print it out. That becomes your pattern for the remaining units. As you move from semester to semester, the updates are easier if you have a printout of the prior semester's materials on which to highlight intended changes—it's much easier to catch everything since the progression through hard copy is more linear.

Your administrator may repost your class for the next semester without the discussion contents; this saves you cleaning out all the discussions by last semester's students, but it will likely clean out the seeded discussions and directions you placed there as well, so that hard copy is important. Create word processor copies so you can cut and paste without rekeying lost materials (HINT: Cut and paste to the word processing documents from the edit or modify mode; this will provide you with any minor html coding you used as you originally created the documents in Blackboard).

Rule #10: Solicit Input and Feedback

As we worked our way through LearningSpace, we learned the value of input up front and feedback during and after. By talking to each other as we planned our classes, we saved time, effort and frustration. We met regularly and shared what we had done and what we were trying to do but had not yet accomplished to our satisfaction. As more individuals came on board, we held LS interest groups and luncheon meetings to talk about what worked and what didn't, what we were planning and what we needed advice on. We intend to continue this practice with Blackboard.

Equally important is student feedback. Early on, without campus-wide help established for our LearningSpace students, the faculty trainers also became the student support. Students called or emailed us when they had access problems, when the system was down, when they were just confused. Those calls and emails helped us to make constant improvements. Now, there is an excellent help system set up across campus for students, but we still request copies of student emails to the helpdesk and we still hand out our own email addresses. If we are going to improve our courses, we need to know when student problems result from unclear directions, broken links, missing documents, etc.

Our experiences have spawned the 10 rules, but those rules can be condensed into the two greatest commandments for all trainers:

- Keep It Simple
- Build on what you already have, continually evaluating and adjusting accordingly

Biographical Sketches

Marilyn Bergmann is an Instructional Technology Coach in the College of Business at UW-Eau Claire. She works with faculty in a variety of technology-oriented areas, focusing primarily on groupware products such as Blackboard and GroupSystems.

Address: College of Business
University of Wisconsin-Eau Claire
Eau Claire, Wisconsin 54702-4004
Email: bergmama@uwec.edu
Phone: 1-715-836-5330

Cynthia Hofacker is the Distance Learning Coordinator for the College of Business at UW-Eau Claire. In this role, she works not only with UW-Eau Claire faculty but also with the four school MBA Consortium to plan and prepare courses for interactive television and on-line delivery.

Address: College of Business
University of Wisconsin-Eau Claire
Eau Claire, WI 54702-4004
E-mail: hofackcm@uwec.edu
Toll-free: 1-888-832-7090

The Ins and Outs of a Team Web Course Development Strategy

Cheryl L. Bielema, Assistant Professor &
Instructional Development Specialist
College of Education and
Information Technology Services

Carl Hoagland, Endowed Professor & Director
Technology and Learning Center
College of Education
University of Missouri, St. Louis

Participants will benefit by the experiences of a team approach to web course development in the Colleges of Education and Nursing at the University of Missouri, St. Louis. Two models will be described; one that focused on course development from learning activities and online instructional strategies; and the other which began with administration concerns for the online academic program, including student support. Interestingly, both models eventually dealt with the same faculty development and training issues, program development, and necessary student support services.

Participants will hear the factors important to both faculty and students in using a web course management tool (i.e., Blackboard™), from the formative and summative evaluations conducted in Fall Semester 2000. From an initial adoption by 186 faculty, using Blackboard in 308 courses, the second semester implementation rate has grown to 270 faculty using Bb in approximately 380 courses. The rate of increase was 33% at end of spring semester 2001. The implications and recommendations will help guide faculty development and training, support services, and institutional decisions for further technology implementation and integration at the institutions represented.

The Changing Campus Culture at the University of Missouri, St. Louis

Campus Support for Blackboard and Other Technology Initiatives

Selection of the web course management software, Blackboard, by campus administration and Information Technology Services (ITS) catapulted the institution into electronically- or web-assisted courses. Faculty members and students were on the fast track for adoption of Blackboard as a course management tool and as a means to enhance teaching and learning at UMSL.

The objective of getting Blackboard™ introduced to a large group of faculty members was accomplished with the help of several key stakeholders. The Council of Deans endorsed the summer training program and provided financial support for faculty participation. Technology support units, campus computing, instructional technology, and the library collaborated in the training. Participants indicated that they had learned from the intensive training sessions; a majority (75%) indicated their skills had increased from the beginning to the end of the program.

A Blackboard support group, headed by an innovative Sociology instructor, developed the implementation plan. The support group also conducted ongoing orientation, re-directed activities of a system administrator and the computing help desk, and instituted instructional consulting services.

Technology and Learning Center Organization and Utilization

The E. Desmond Lee Technology and Learning Center's purpose is to bring the College of Education from a place with limited use of technology in instruction to one of ubiquitous use of technology in instruction. The environment—the room was originally designed as a chapel with a mosaic tile ceiling—is conducive to collaborative work. Clusters or pods of workstations exist for students and faculty to carry out collaborative projects. A seminar room is available with a SmartBoard™ and connected workstations. A presentation and discussion area exists for faculty and students seminars. A cyber lounge is set up for informal gatherings. The Center is intended to be a place to "hang out." An emphasis has been placed on having as few rules as possible, and on a staff that provides a level of assistance that encourages faculty and students to use technology.

How the Course Development Team Worked

Collaborative learning includes both skilled discussion and a continuing dialogue. Palloff and Pratt (1999) distinguish the terms this way: "Discussion involves a volley of views between people.... In a dialogue all the participants are open to the idea of reconstructing their mental models" (p. 119). Those were the prevailing guidelines for how the course development team worked together over a semester.

Contracted Work With Select Faculty

Faculty members were selected to participate in the development of courses based on (1) the content needs for a possible online degree (Early Childhood Education and Adult Education), (2) interest in developing a course, (3) their reputation as a "good instructor," and (4) their expressed willingness to be critiqued by colleagues. Each of the participants received a course buy out as compensation for the development of one online course.

The participants were oriented to the use of Blackboard by an instructional designer. They were asked to complete assignments and engaged in conversations about the learning activities or teaching strategies typically included in face-to-face instruction. Online strategies were discussed and sometimes debated, advocated and defended. The give and take of the discussions created a healthy pedagogical climate.

Assignments included:
(1) Uploading course requirements for discussion by all
(2) Identifying online resources
(3) Developing online activities for the course
(4) Participating as students in the course web sites

Leadership was shared as the group got acquainted with one another. The Director of the Technology and Learning Center hosted weekly sessions and served as facilitator. He and the instructional designer marshaled resources, both human and technical, to keep the group moving forward.

Team Interactions and Discussions, and Influences

Ground rules forbade pontificating and diversion tactics. The team agreed on objectives and outcomes of the sessions and meetings were held weekly, no matter whom couldn't attend. The discussions centered on pedagogy and self-directed learning (Knowles, 1975), as the means to improve student learning in the online environment. A faculty member created course content and presented this content to colleagues. A discussion would always follow along with an appropriate update.

Distractions noted by the participating faculty, principally the need to continue service and research, has resulted in a discussion about alternative incentives to be offered future web course developers. Faculty may be able to request a buy-out of one course, a stipend for course development and teaching, or an excused service option. These alternatives could increase the "attractiveness" of web course development among skeptical or overly committed faculty members.

Next Steps: Moving the Target to an Online Degree Program

Three courses in Education are underway in the 2001 summer eight-week term. Another five in Education and Nursing are in the course catalog for Fall Semester, 2001.

Momentum building for online programs in Education has prompted the Director of the Technology and Learning Center to propose two online Master's programs: Early Childhood Development and Adult Education, with an HRD emphasis. The team brought together for web course development has gotten involved in broader collaborations, including advocacy for these online degree programs and team-led courses.

The first concern for the College of Nursing was organization and development of the online RN-to-BSN completion program: course selection; length of program; targeted student audience and marketing plans. The planning group included program coordinator, Associate Dean, technology director, continuing education director, marketing director, and instructional designer. Those key program decisions were made in the fall semester, 2000.

The Nursing group to be involved in joint web course development was convened at the start of spring semester, 2000. The team has learned the tools by "using the tools." The migration of face-to-face instructional techniques to the online milieu was brainstormed and critiqued following the team model established for the Education team before them.

What We Learned for the Good of the Online Education Community

Impact of a "Hotbed" for Technology Integration

Holding meetings in the Technology and Learning Center where the culture is inclusive was important for the Education group. Help was available and suggestions could be immediately tried out. Discussions on pedagogy were also valuable as individual faculty were was able to incorporate suggestions and examples from one another.

With the development of courses, the faculty starting viewing the Technology and Learning Center as a hothouse for technology. Ideas could be tried out in a safe environment. The ideas could then be improved. Faculty also learned that they could come to the Center for assistance on an ad hoc basis. Thus the idea that the center "incubated" ideas became a reality to faculty who participated in the project.

Surveys of the Participating Faculty and Students

As one faculty member put it, "the online environment is the perfect place for self-directed learning to take place. All the principles I've advocated for my adult learners can be realized in team projects, like the one I participated in!"

Members of the web course development team agreed to reflect on the development experience in a semi-structured interview. Their individual interviews will be videotaped and "quotable quotes" used for a variety of video-streamed marketing and progress reports growing from this pilot team effort.

Student evaluation of the online courses and support services has been ongoing, since the campus-wide implementation of Blackboard™ in fall, 2000. Computer and access demographics and learning outcomes are also part of the evaluation data to be shared. A graduate student is currently collecting anecdotal data from students and faculty for online classes being taught in the winter semester and will continue to collect data for the classes that will be taught in the summer and fall semesters. The implications drawn from these data will hopefully result in administrative processes and procedures developing in areas of faculty incentives, integration of student support and technology, and the commitment to develop specific degree programs.

The Dean of the College of Education has agreed to a request from the authors to support the development of two online programs. A mechanism for funding the programs has been determined, and the Council of Deans is considering the University wide issues of online registration, support, and other student services that are essential for an online program success.

Data gathering, sharing of results broadly, and the support of innovative faculty members involved in team web course development have all contributed to the successful implementation of online course and programs at our institution. We anticipate that other institutions will be able to use our case study for development and refinement of the processes.

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Biographical Sketches

Carl Hoagland is the Emerson Electric Endowed Professor of Technology and Learning at the University of Missouri–St. Louis. He has a broad background in technology and its applications in education. He is the author of numerous publications in technology and has held positions on the faculty at the University of Massachusetts, Webster University in St. Louis, the National Teacher Training College (NTTC), in Lesotho, South Africa, Incarnate Word University in San Antonio, Texas. As an Expert for UNESCO in Lesotho, Africa, Hoagland helped establish the National Teacher Training College. He founded and directed the St. Louis Regional Consortium for Education and Technology. At UMSL, Hoagland established the E. Desmond Lee Technology and Learning Center. Its most recent honor is the 2001 Computerworld Honors Program Laureate.

Address: 8001 Natural Bridge Rd.
St. Louis, MO 63121-4499
E-mail: hoagland@umsl.edu
URL: http://www.umsl.edu
Phone: (314) 516-4802
Fax: (314) 516-7317

Cheryl Bielema has instructional design experience at UMSL and the University of Illinois. Development and evaluation of new applications of technology is her special expertise. She led a multi-institutional Biotechnology Issues seminar via satellite, funded by A*DEC in 1996. She served as Training Lead for a Department of Defense supercomputing project, at the Army Research Lab, Aberdeen, MD, 1997-1998. Bielema has presented topics of technology adoption in higher education and web course development at recent sessions of the National Extension Technology Conference, Midwest Research-to-Practice Adult and Continuing Education Conference and MOREnet (HELIX) Conference.

Address: 8001 Natural Bridge Rd.
St. Louis, MO 63121-4499
E-mail: bielema@umsl.edu
URL: http://www.umsl.edu/technology/fis/index.html
Phone: (314) 516-7134
Fax: (314) 516-7317

The Student Voice: Results of an Attitudinal Survey

Katharine A. Bohley, DBA
Assistant Professor of Business
University of Indianapolis

Elizabeth A. Kiggins
Assistant Professor & Director, Center for Instructional Technologies
University of Indianapolis

George Weimer, Ed.D.
Professor of Teacher Education and Music
University of Indianapolis

The University of Indianapolis is an independent, comprehensive university affiliated with the United Methodist Church. Approximately 1,900 full-time undergraduate, 900 graduate and 1,200 non-traditional students pursue credit in undergraduate, graduate, and continuing education programs.

The presenters have analyzed data collected from a student survey based on three years of institution-wide web-enhanced, web-based and distance learning courses using Blackboard. The online survey consists of demographic data and several attitudinal questions scored on a five point Likert-type scale (see end of paper). Additionally, open-ended questions are provided to the students. Anonymous responses are used to improve course offerings in the web-learning environment at the university. Implications of the data analysis reveal valuable information for colleges whose faculty and administrators have concerns about changing the traditional university interaction of faculty and students in a classroom.

The university utilizes Blackboard to support three types of web instruction: those using the web to augment instruction (web-enhanced), courses that have significantly reduced seat time (web-based) and courses delivered entirely via the web (distance learning). For the purposes of this paper data have been aggregated by term. Further data analysis will be presented in the session.

Scope of Research

A total of 1410 students responded to the survey over the three-year period. Table 1 shows the breakdown of the respondents by semester. As indicated in Table 2, the number of male respondents was approximately 30%, and the number of female respondents was approximately 70%. This is not surprising because it is representative of the university demographics. As indicated in Table 3, approximately 45% of the respondents were under the age of 20 when taking the survey. Moreover, almost 85% of the respondents are under the age of 30. Less than 7.8% of the respondents were over the age of 41.

Table 1 (Number of Respondents by Term)

Term	Number of Respondents
Semester II, 1998-99	104
Semester I, 1999-2000	392
Semester II, 1999-2000	458
Semester I, 2000-2001	291
Semester II, 2000-2001	165
Total	1410

Table 2 (Gender)

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	419	29.7	30.2	30.2
Female	970	68.8	69.8	100.0
Missing	21	1.5		
Total	1410	100		

Table 3 (Age)

Age	Frequency	Percent	Valid Percent	Cumulative Percent
Under 20	63.5	45.0	45.8	45.8
21-30	536	38.0	38.6	84.4
31-40	108	7.7	7.8	92.2
41-50	80	5.7	5.8	98.0
Over 50	28	2.0	2.0	100.00
Missing	23	1.6		
Total	1410	100.0		

Table 4 (Correlation)

	CR	SC	CS	IA	II	SI	PA	LM	MT	DA	OR	EM	RE	TE
CR		**	**	**	**	**	**	**	NS	**	**	**	**	**
SC	**		**	**	**	**	**	**	NS	**	**	**	**	NS
CS	**	**		**	**	**	**	**	NS	**	**	**	**	**
IA	**	**	**		**	**	**	**	*	**	**	**	**	NS
II	**	**	**	**		**	**	**	*	**	**	**	**	**
SI	**	**	**	**	**		**	**	**	**	**	**	**	NS
PA	**	**	**	**	**	**		**	*	**	**	**	**	n*
LM	**	**	**	**	**	**	**		**	**	**	**	**	n**
MT	NS	NS	NS	*	*	**	*	**		**	NS	**	NS	n**
DA	**	**	**	**	**	**	**	**	**		**	**	**	NS
OR	**	**	**	**	**	**	**	**	NS	**		**	**	NS
EM	**	**	**	**	**	**	**	**	NS	**	**		**	NS
RE	**	**	**	**	**	**	**	**	NS	**	**	**		NS
TE	**	**	**	NS	n*	NS	n*	n*	n**	NS	NS	**	NS	

* indicates a positive correlation at the .05 level   ** indicates a positive correlation at the .01 level

n indicates a negative correlation

CR = Understood Computer Requirements
SC = Sufficient Computer
CS = Sufficient Computer Skills
IA = Instructor Available
II = Sufficient Instructor Interaction
SI = Sufficient Student Interaction
PA = Appropriate Pace

LM = Learned More than a Traditional Class
MT = Required More Time than a Traditional Class
DA = Appropriate Delivery Approach
OR = Course Material Organized
EM = Enroll in More
RE = Recommend this type of course
TE = Term, Year of course

Chi-Square was applied to data to test the hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship. Pearson Correlation (Cross-Tabs) coefficient r, measures linear association between two variables with values ranging from –1 (perfect negative relationship) and +1 (a perfect positive relationship). Summary of the correlations are in table 4. Analysis of Variance (ANOVA) was applied to data by gender and age. A less than 0.05 significance level was used.

Conclusions

Females understood the requirements and reported to have believed that they had sufficient skills for this type of course more so than males. Moreover, more females than males reported they would enroll in more courses of this type, and they would recommend this type of course to others. The older the age of the student, the more significant the relationship to the following variables: understood requirements, computer sufficient, skills sufficient, required more time, delivery approach, course material organized, enroll more, and recommend more. Correlations among survey items are indicated in table 4.

Recommendations

Data analysis indicates that the survey items contained useful information. The exceptions are the items: "On average, how much time did you spend in a week accessing course materials?" and "On average, how much time do you spend per week with a traditional course?" Student responses were vague and of little meaning. Otherwise the only survey additions we plan to make in the future will assist in collection of more specific demographic data such as department and school in which the course is offered, student's major, and full-time or part-time student. We also plan to ask each instructor what technologies they are using in addition to Blackboard. These may affect student responses to items relating to technology.

Distance Learning Assessment

Bio/Demo Information:

1. What is your gender?
   - ☐ Male
   - ☐ Female
2. What is your age?
   - ☐ Under 20
   - ☐ 21 – 30
   - ☐ 31 – 40
   - ☐ 41 – 50
   - ☐ Over 50

3. . What is your county of residence? (International students, please provide your country):

Computer-Related Questions:

4. Which computer did you use most frequently?
   - ☐ Macintosh
   - ☐ Windows 95/NT
   - ☐ Windows 3.1

5. Which Web browser did you use most often?
   - ☐ Netscape 4.0 or later
   - ☐ an older version of Netscape
   - ☐ I don't know
   - ☐ Internet Explorer 4.0 or later
   - ☐ an older version of Internet Explorer

6. How did you most often access course materials?
   - ☐ University computer lab or residence hall
   - ☐ Direct dial-in to U of I
   - ☐ IndyNet
   - ☐ Oher Internet Service Provider (AOL, GTE, etc.)
7. What is the speed of your modem?
   - ☐ 28.8K
   - ☐ 33.6K
   - ☐ 56K
   - ☐ A direct connection
   - ☐ I don't know
8. How much memory is installed on your computer?
   - ☐ Less than 16MB
   - ☐ 16MB
   - ☐ 32MB
   - ☐ 64MB or greater
   - ☐ I don't know

Likert Scale:

1 –Strongly Agree	2 –Agree	3 – Undecided
4 – Disagree	5 – Strongly Disagree	6 – N/A

9. I understood course requirements before I enrolled: 1 2 3 4 5 6
10. My computer was sufficient to access the course materials: 1 2 3 4 5 6
11. My computer skills were sufficient for this course: 1 2 3 4 5 6

Technical Issues:

12. I did not encounter any technical problems when I tried to access course materials: 1 2 3 4 5 6
13. If any, what types of technical problems did you encounter while trying to access course materials? Please give error messages if you recall them. *(open-ended)*

Course Information:

14. Course being evaluated: Student selects course from a drop-down menu
15. In which term are you enrolled? Student selects term from a drop-down menu

16. What is the level of the course?
    - ☐ Undergraduate
    - ☐ Graduate
    - ☐ Continuing Education
17. The course briefing/orientation (if you received one) explaining how to use the software was helpful in making the most of the course: 1 2 3 4 5 6
18. The instructor was available to provide assistance: 1 2 3 4 5 6
19. My interaction with the instructor was sufficient: 1 2 3 4 5 6
20. My interaction with other students was sufficient: 1 2 3 4 5 6
21. The pace at which the course progressed was appropriate: 1 2 3 4 5 6
22. I learned more in this course than in a traditional course: 1 2 3 4 5 6
23. The course required more time than a traditional course: 1 2 3 4 5 6
24. The delivery method used in this course was appropriate: 1 2 3 4 5 6
25. Course materials were well organized: 1 2 3 4 5 6
26. I would be interested in more courses offered via this technology: 1 2 3 4 5 6
27. I would recommend other courses delivered via the same technology: 1 2 3 4 5 6
28. Was your Internet access to the course adequate? Please explain why or why not: *(open-ended)*
29. What are the strengths of offering a course via this technology? *(open-ended)*
30. What are the weaknesses of offering a course via this technology? *(open-ended)*
31. What would you change about how this course was taught? *(open-ended)*
32. On average, how much time did you spend in a week accessing course materials? *(open-ended)*
33. On average, how much time do you spend per week with a traditional course? *(open-ended)*
34. Please list any additional comments you may have: (open-ended)

Biographical Sketches

Katharine A. Bohley is an assistant professor in the School of Business at the University of Indianapolis. Her research interests include applications of technology in the classroom, development of interactive multimedia for marketing purposes, and international marketing research. Dr. Bohley has used the Blackboard course management system to develop entirely on-line courses and supplemental resources for her students.

Address: University of Indianapolis
1400 East Hanna Avenue
Indianapolis, IN 46227
E-mail: kbohley@uindy.edu
Phone: (317) 788.3215
Fax: (317) 788.3300

Elizabeth Kiggins is the Director of the Center for Instructional Technologies and Assistant Professor of Instructional Technology at the University of Indianapolis. She works with faculty to integrate technology into instruction to promote learning by conducting faculty development workshops and providing support for their distance learning initiatives. Ms. Kiggins supports Web-based delivery of courses and courses delivered via interactive video conferencing systems. She also teaches courses entirely via the Web.

Address: University of Indianapolis
1400 East Hanna Avenue
Indianapolis, IN 46227
E-mail: kiggins@uindy.edu
URL: http://cit.uindy.edu
Phone: (317) 788.6154
Fax: (317) 788.3499

George Weimer, Ed.D., is a Professor of Music and Teacher Education at the University of Indianapolis. He teaches Microcomputer Applications in Education and Music and a Multimedia Presentations course for the School of Education. Dr. Weimer is the author of music listening software programs and has published articles related to use of technology in elementary education and music education. He has developed several courses using the Blackboard course management system.

Address: University of Indianapolis
1400 East Hanna Avenue
Indianapolis, IN 46227
E-mail: weimer@uindy.edu
URL: http://facstaff.uindy.edu/~weimer
Phone: (317) 788.3256
Fax: (317) 788.3300

On-Line Teaching and Learning:
The Value of Assessment Tools

María Bonilla-Romeu, Ed.D.
Department of Business Administration
Inter American University of Puerto Rico
San German Campus

Distance learning is considered a phenomenon of major importance in education. Many educational organizations are changing their paradigms of education and are entering the exciting arena of the different modalities of distance learning.

On-line teaching is of major concern when talking about distance learning, because it one of the most used approach (Charp, 2001). Technology is the major factor responsible for this phenomenon, and the wonder of the Internet represents assets to educational institutions trying to provide distance learning to people within a diverse spectrum of personal and professional realities.

Because of its impact in the educational setting, it is very important that educational administrators develop and use strategic planning to assess the results of what they are doing or planning to do in distance education. Formative assessment tools are useful to provide feedback about the results of the teaching and learning process, which assure the quality of distance learning offerings.

Assessment on Teaching and Learning

On-line courses are a major component of distance education offerings in many of the educational institutions. This reality represents a challenge to teachers and students who try to escape from a traditional paradigm of the teaching and learning process. Assessment tools are relevant means of increasing effectiveness of on-line courses. According to Angelo & Cross (1993), assessment is "an approach designed to help teachers find out what students are learning in the classroom and how well they are learning it." Assessment is a valuable tool in education because it will assist with measuring student learning and improving instructional programs.

Some of the characteristics of the teaching and learning assessment are that it be learner-centered, teacher-directed, mutually beneficial, formative, context specific, ongoing, and rooted in good teaching practice. These characteristics should be used as a means to increase interactivity. In a face-to-face classroom as in a virtual scenario, appropriate assessment techniques provide excellent opportunities for interaction between teachers and students, a key element to the achievement of educational goals (Frankola, 2001).

Assessment and the Learning Experiences

The physical distance between the students and teachers in an on-line scenario requires increasing the interaction between them; therefore, assessment techniques become one of the most valuable tools to achieve this objective. By using assessment techniques, teachers have the opportunity to realize how,

how much, and how well the students are learning what they are trying to teach. Teachers become more proactive in their dissemination of information through direct interaction with the students. On the other hand, by using assessment techniques students can interchange information with the instructor concerning the teaching style and the content of the course. For teachers of on-line courses, this is an excellent way to become aware of their teaching method as they have the direct feedback from the students.

Using Assessment to Increase Interaction

Teachers play the most important role in developing strategies to shorten the physical distance between them and the students, which is why it is necessary to pay special attention to the transactional distance. According to Moore (1991), the transactional distance is determined by two variables: dialog and structure. Dialog is the extent to which the software, the student and the curriculum or content, and the teachers are able to respond to each other. Structure is defined as the way in which a program responds to the students' needs. Teachers can use assessment tools to shorten the transactional distance and to increase the dialog between the parts involved in the educational process: students, teacher, content, and interface/technology.

Assessment of Student–Student Interaction

The lack of interaction between students in the learning process is one of the concerns of the detractors of distance learning. It is well known that interaction in face-to-face courses a is key element in the development of certain characteristics in students in the learning process. A good assessment program should pay attention to developing student-student interaction in on-line teaching and learning.

Peer assessment is one of the approaches to promote interaction between students. This kind of assessment technique is of more limited use because it requires training and an organized environment to be effective. (White & Bouchillon, 2000) Peer assessment is described as the process in which students are evaluating each other work using objective criteria.

There are, however, several techniques that can be used to increase interaction among students in a virtual learning scenario. Newsgroups are excellent tools for promoting student interaction as well as providing a means of assessment. Their contributions to the development of topics already presented in the newsgroup will provide them with opportunities to interchange ideas with other virtual students. The participation in this forum should be mandatory to encourage students to participate. The teacher should be aware of the contribution of each student and provide feedback whenever necessary. This forum is especially recommended to present assessment techniques, such as, case studies, problem solving, and incomplete outlines. The interaction stimulated by the newsgroup provides more equality among the students and teachers in the on-line setting. This is because the lack of a face-to-face reality seems to put the students at the same level of intellectual challenge since "students feel free to debate intellectual ideas and even challenge the instructor" (Smith, Ferguson, & Caris, 2001, p 5). A well-designed checklist should be a good assessment instrument to objectively evaluate the student contribution to the forum.

Virtual teachers can use rubrics and checklists to engage students in group-work. Teachers can prepare the instruments and give the opportunity to the students to evaluate the criteria and scale used in the instrument (intra-group interaction). As each group completes the evaluation, each group evaluates the work prepared by their virtual classmates and make recommendations (inter-group interaction). Different kinds of rubrics can be developed according to special activities to be evaluated, for example, PowerPoint™ presentations, portfolios, critical analyses, essays, and research papers.

The development of concept maps is another technique useful in on-line teaching. The idea is that students develop the ability to present information in sequence. This technique is useful when a professor assigns a topic or concept to a group of no more than five virtual students, and, using the chat, E-mail or the news group, students within the group start adding parts to the map until it is finished. This technique provides a means to assess synthesis and creative thinking skills, and may also improve student self-esteem because of the contribution each makes to the finished product.

Assessment Tools to Provide Student–Teacher Interaction

Effective teachers always find ways to demonstrate that learning has occurred, and they are going to expand the assessment measures they use. Teachers can use a variety of assessment tools to determine whether the students are achieving the objectives of the course. Structured chat dialog, e-mail communication, the built-in calendar, and virtual office hours are effective tools to encourage student-teacher interaction.

Case studies and/or problem solving techniques provide virtual students the opportunity to interchange ideas with other students and with the teacher, and the teacher receives relevant feedback concerning student comprehension of the content. Reflections and problem solving provide the teacher a certain degree of flexibility to develop student independence. A clearly defined special project is a very good assessment technique for use in virtual courses, because it develops the student's potential and is a good means for providing the student with step-by-step feedback. Other assessment techniques that virtual professors can use are: incomplete outlines, anecdotal records, checklists, rubrics, and class assessment sheets. Virtual teachers can also use on-line diagnostic tests (essay, short answer, matching, multiple choice) to determine the degree of competence students have acquired. This technique should be used for formative assessment.

Assessment of Student–Content Interaction

The interaction of the student with the content is very important in on-line teaching, because the students need to know if they are mastering the content with which they are interacting. On-line teachers need to use different teaching techniques to involve the students with the content. Activities such as, using on-line resources to complete empty outlines, to answer case studies, to solve problems, and to conduct virtual company visits are of relevance to assess student achievement. The option of on-line diagnostic tests is highly recommended to promote student-content interaction. Student-generated test questions are relevant skills and application assessment tools. Portfolios have also been shown to be one of the most effective assessment techniques in on-line courses (Reyes, 2001; Suen, 200), because they provide more reliable information conducive to a formal evaluation. In addition, well-developed portfolio activities are highly recommended in an on-line setting to show content mastery, especially for synthesis and creative thinking skills.

Assessment of Student–Interface Interaction

Virtual teachers have to provide a variety of experiences in which the students interact with the technology/interface. Technology gives access to more learning resources, which is important to enrich the learning experiences. If a commercially designed platform or template is used, the teacher has the responsibility of teaching the student how to interact with the different components. For example, the teacher should use the calendar to post all the activities within the course, and other activities of interest to the students.

If a platform has the built-in e-mail and chat options, it should be required that students use them to communicate with other virtual classmates. It may be necessary to provide instructions regarding the correct use of e-mail attachments. The teacher should use the tests and quizzes options to enable students to keep assessing what they know about the topics already covered as they master the software. The skills acquired using the interface will create confidence and will motivate students to keep using these tools, and make the interface transparent in the teaching and learning process.

Research Findings: Importance of Assessment Techniques

The use and the effectiveness of assessment techniques in on-line courses is supported by the findings of research conducted at Inter American University of Puerto Rico (Reyes, 2001), the largest private educational institution on the Island. A random and stratified sample of teachers offering 125 on-line courses was selected to conduct the study.

The results of the study showed that teachers had high knowledge of the assessment techniques. The professor who were teaching on-line courses identified problem solving, reflections, E-mail, portfolio, and asynchronous news groups as the best known, most used, and most effective assessment techniques.

Other information gathered from the study pointed out the importance of considering aspects related to the design, process, and technological infrastructure of on-line courses. Professors pointed out the importance of these aspects because of their relevance in improving the assessment process.

Some of the recommendations from the study are: (a) to develop faculty training activities in the area of assessment techniques, (b) to incorporate the most used techniques into faculty training and provide teachers with other techniques in order to use them in on-line teaching, and (c) to develop an institutional assessment process for distance learning with special attention to on-line teaching and learning.

Distance learning and assessment are two areas of interest in higher education, and this research deals with these important areas, for which we do not find many research studies. Recommendations from this study pointed out the importance of providing teachers with the necessary skills to use assessment techniques to improve on-line education.

Conclusion

Since distance education students and teachers are physically separated, the interaction between them becomes a major element in achieving the educational objectives. One of the basic assumptions of assessment states that to improve their learning, students need to receive appropriate feedback on time and frequently. Teachers are the key resources to provide this feedback within a time frame, because they are the main manager of the virtual classroom. Quality of learning is expected to be related to the quality of teaching, which is why teachers have to use valid and reliable assessment tools as a medium to improve the quality of the virtual learning experience.

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Biographical Sketch

Dr. María Bonilla is a full professor in the Department of Business Administration at Inter American University of Puerto Rico, San Germán Campus. She coordinated the Distance Learning Academic Project for the Academic Affairs Vice Presidency of the University. Dr. Bonilla has trained faculty in interactive videoconferencing and on-line teaching techniques. She designed and offered the graduate course Fundamentals of Distance Learning using videoconference and on-line approaches. She has been a resource in seminars and conferences in Puerto Rico and at international forums. She has also published several articles related to distance learning. Dr. Mara Bonilla has a certification in Distance Learning from Texas A & M.

Address: P. O. Box 5100
San Germán, PR 00683
E-mail: romeu@caribe.net
Phone: (787) 264-1912, Exts. 7543-7544
Fax: (787) 899-0524

Stating the State of E-learning:
Surveys in College and Corporate Training Settings

Curtis J. Bonk, Ph.D.
Associate Professor and President
Indiana University and CourseShare.com

Christopher Essex
Distance Education Specialist
Indiana University School of Education

The objective of this research was to learn about the common obstacles, supports, and experiences as well as the tools used among early adopters of the Web as a teaching resource. Whereas most studies simply ask about online experience, time investments, and common complaints, this study attempts to understand some of the pedagogical tools that could benefit college faculty and corporate trainers today as well as in 5-10 years. For instance, what is missing from current Web-based learning courseware? How can we move from courseware that simply warehouses students to tools that engage them in interactive and collaborative experiences? Equally important, how can college faculty and corporate trainers share their online learning successes and failures with other instructors? What type of support mechanisms should decision makers provide for online instructors? And who is making these decisions?

Study #1: College Faculty

Many reports point to a recent surge in online course offerings in university settings as important evidence that billions of dollars are about to be spent on the postsecondary online market (Upitis, 1999; Web-based Education Commission, 2000). By 1997-98, more than 50,000 distance education courses were already offered by over 1,000 institutions (National Center for Educational Statistics, 1999).

There are a number of other summary reports attempting to describe and evaluate the use of distance education technology in higher education (Bonk & Wisher, 2000; Phipps & Merisotis, 1999; Russell, 1999; The Report of the University of Illinois Teaching at an Internet Distance Seminar, 1999). Some reports speak to the challenges of teaching in an online world, including issues of compensation, time, ownership, profitability, training, technology infrastructure, and university policies. Jaffee (1998), for instance, discusses the costs of online instruction as well as the forms of resistance to such courses and programs (Jaffee, 1998). Others point to new economic opportunities (Upitis, 1999). Such reports document key trends, social demographics, stakeholders, policy makers, and workplace needs (Cronin & Duffy, 1997). Still other reports detail newly formed and tenuous partnerships and consortia.

Our first report is a based on a survey of 222 college faculty members, most of whom have been early adopters of Web-based instructional technology. This survey report is intended to inform administrators and courseware designers of the benefits and challenges of using Web-based learning tools in higher education. It also provides suggestions about the types of tools, activities, resources, and support structures that might enhance online learning in college and corporate settings. It has five primary goals:

1. To identify the resources, tools, and activities that college instructors desire in their Web-based teaching efforts;
2. To document the gaps between online teaching practices and preferences;
3. To understand some of the key obstacles as well as support structures for Web-based teaching;
4. To point to online learning tools and communities that might be developed to enhance teaching and learning in higher education settings; and,
5. To determine who is responsible for making online learning decisions.

In effect, this study intends to document how faculty educators are being trained, supported, and rewarded for online instruction. It also seeks to determine the types of online tools and activities that faculty prefer. Additionally, this survey explores college instructor attitudes related to online learning obstacles and support. It addresses their perceptions of controversial online learning issues such as course ownership and quality, online program accreditation, online teaching and learning opportunities, and the general utility of the Web as a teaching and learning resource. The conclusions are intended to help those teaching in online environments as well as those developing policies and funding new online initiatives. The findings may also be useful to companies developing online tools for distance learning.

Methodology

Respondent Background

Perhaps no technology has so swiftly assumed prominence in both educational and commercial settings as the Web. Those who previously found higher education too expensive or physically inaccessible can now access a myriad of online information resources. Ideas and feedback from online expert guests, mentors, and peers are now available in college classes. Online student mentoring can come from practitioners in the field, experts at the North Pole, or graduate students down the hall (Bonk & King, 1998). Collaborative teaming in online college settings knows no bounds. As a result, new instructional expectations for college faculty are emerging.

Description of Survey Respondents

This survey targeted instructors and trainers who were likely to have greater experience with these new teaching methods and tools than others. Sixty-four percent of the survey respondents were drawn from instructors using the MERLOT Web site (see http://www.MERLOT.org). Another 36 percent were from the World Lecture Hall (WLH) Web site (see http://www.utexas.edu/world/lecture). Most of these early Web adopters were males and nearly half were over fifty years old. Over two-thirds of our postsecondary respondents were from public institutions. Most of our sample worked at large institutions followed by medium-sized and small institutions. Finally, the teaching experience of our postsecondary respondents was mixed though 36 percent had more than 20 years of experience and 34 percent had 10-20 years of teaching experience, whereas few had less than 4 years of experience.

General Survey Questions and Findings

In addition to basic demographic information, the faculty survey addressed attitudes about course material ownership, online learning quality, instructor compensation, and time commitments. The survey also asked about Internet access and attrition, platform choices and preferences, teaching load, obstacles, support mechanisms, resources, tools, and activities, technology decision-making processes, institutional motives, and freelance possibilities.

The findings of this survey paint both pessimistic and optimistic portraits of the state of Web-based teaching and learning in higher education and corporate training. While a myriad of collaborative tools and institutional support mechanisms were identified as needed, many of the early adopters of the Web for college teaching already have extensive experience with both fully online and blended courses. And they seem to enjoy online teaching despite barriers related to time, training, recognition, and overall institutional support. Moreover, new opportunities to embed the Web in instruction as well as to share the results online in an online community of peers were revealed throughout this survey report.

What types of online experiences do these early Web adopters have? Most of these instructors have experiences teaching in Web environments, including both partially online and fully online courses. While the vast majority of our survey respondents had been active in posting course resources, syllabi, or personal information on the Web, not all had previous experience in Web-based instruction. Nearly a quarter of the respondents had never taught even a portion of a course online. On the other hand, nearly 4 in 10 respondents had taught courses partially online. Another 18 percent had experience teaching fully online courses. In addition, 19 percent had done both—partial and completely online course.

In terms of course delivery, many of their institutions offer a choice between two or more platforms. And while administrators primarily make courseware decisions, departments, faculty, and technical support personnel are often consulted in such matters. Courseware tools appealing to early Web adopters are those that are flexible, easy to use, comprehensive, interactive, well supported, functional, and attractive.

What tools are needed? Early adopting faculty members and trainers are looking for tools to share syllabi, post cases and lecture notes, upload and download files, provide feedback, hold discussion forums, demonstrate ideas, and foster student collaboration. In addition, they would like access to online journal articles and papers, glossaries, teaching resources, and search engines. Conference information and library resources are also viewed as helpful. These professors want to utilize the Web for sharing teaching ideas and expert advice or answers to their teaching problems. And while they ask for additional technical support and instructional design aids, they are fairly savvy in their use of common Web tools.

What are the online supports deemed necessary for effective online teaching? And what are the key obstacles or barriers common to online teaching? In terms of supports, college instructors would like to be recognized for their efforts with release time, stipends, or additional salary. In regards to obstacles, preparation time and technical support were the key barriers noted by our respondents. It appears that college instructors would like technical or instructional design help as well as training in

Web-based instruction. In addition, Web training as well as reports and guidelines were perceived as valuable.

What's next? Many college faculty members anticipate teaching online more frequently in the future, especially as freelance instructors. Before this occurs, it would be useful to develop online communities for these freelance instructors. To establish such communities, some colleges and universities might provide Web-based support mechanisms including online course development, library resources, professional information about upcoming conferences, survey and evaluation services, simulation tools, freeware, teaching advice, mentoring or tutoring help, and relevant online papers and reports. Web instruction is a complex endeavor that needs support (Bonk, Kirkley, Hara, & Dennen, 2001).

There were seven recommendations based on this survey. The first three relate to instructor/trainer development including training, recognition and support, and sharing of expertise. The other four concern online learning policy, research, courseware and tool development partnerships, and pedagogy.

Study #2: Corporate Trainers and Instructional Designers

A follow-up survey during May 2001 was conducted related to e-learning in corporate environments. In this study, 199 corporate trainers, training managers, instructional designers, and chief learning officers discussed their e-learning experiences and preferences. The sample was younger and more female than the first one. The majority were instructional designers, trainers, or training managers.

Besides general demographic information, survey questions related to e-learning incentives, attitudes, methods, obstacles, experiences, policies, vendors, resources, pedagogical strategies, and activities. According to the respondents, most worked for corporations that developed at least some Web-based training internally. Access, employee retention, job performance, interactivity, learner satisfaction, and standardization of content were the primary reasons given for their firm's interest in e-learning. Incentives for e-learning were quite varied and included public recognition, increased job responsibility, salary, and job security. The favored instructional approaches for Web-based instruction included exploratory situations as well as case-base teaching and student-generated content. Other instructional methods such as lecturing, Socratic questions, role-play, mentoring, group collaboration, and discussion were deemed better supported in traditional environments. Web-based activities deemed useful included online cases or job reflections, brainstorming, group projects, and electronic mentoring. In effect, these trainers and designers favored online environments that were relevant, responsive, goal driven, flexible, and personally fulfilling. At the same time, ice-breakers, article discussions, role play, debates, and product displays were viewed as less engaging or useful online. Less valuable online characteristics included fostering conflict, discussion, belongingness, community, and variety. As with the faculty survey, many noted the need for more collaborative learning tools and freelance teaching opportunities.

Final Thoughts

As indicated above, there were a variety of interesting and important findings within this research. What these studies clearly reveal is that while many faculty members and trainers are adopting Web technologies in their teaching, the levels and types of support structures vary tremendously. As new tools, courseware platforms, and standards are developed, there is a need for online learning leadership and exemplary models or frameworks for Web-based instruction. When this occurs, tools for online sharing of resources will have a major impact on college and corporate learning and instruction in this decade and beyond. To facilitate this change, two separate free reports, *Online Teaching in an Online World*, and *Online Training in an Online World*, will be made available (see co-sponsor Web sites: *http://www.courseshare.com/reports.php* or *http://www.jonesknowledge.com/higher/resources_research.html*).

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Biographical Sketches

Dr. Curtis J. Bonk is a former CPA and corporate controller who received his master's and Ph.D. degrees from the University of Wisconsin. Curt Bonk is now an associate professor in the Departments of Counseling and Educational Psychology as well as Instructional Systems Technology at Indiana University (IU). He also is a core member of the Center for Research on Learning and Technology. He received the Burton Gorman teaching award in 1999 and the Wilbert Hites Mentoring Award in 2000. During the past few years, he has been a visiting scholar in Finland, Canada, and Australia. Curt is currently a Senior Consortium Research Fellow with the Army Research Institute. He recently edited the book *Electronic Collaborators*, published in 1998 by Erlbaum. He is in demand as a conference speaker and keynote. He is President of CourseShare.com, which he founded in 1999.

Address: Indiana University
School of Education: Room 4022
Dept. of Counseling and Educational Psychology
Bloomington, IN 47405-1006
E-mail: CJBonk@indiana.edu or cjbonk @courseshare.com
URL: http://php.indiana.edu/~cjbonk and http://CourseShare.com
Phone: (812) 856-8353 and (812) 855-2282

Chris Essex is the Distance Education Specialist for the Indiana University School of Education Distance Education Program. Since 1994, he has assisted faculty members in their efforts to develop online courses. He has twice received the Jerrold E. Kemp Fellowship from Indiana University for his research work. He currently works as consultant for CourseShare.com, focusing on survey research and software development. He is ABD in Instructional Systems Technology from Indiana University.

Address: Education 2002
Indiana University
Bloomington, IN 47405-1006
E-mail: cessex@indiana.edu
Phone: (812) 856-8062

The Benefits of Video and Web-Based Technology in a Distance Learning System

Stacie Brigido, Director
Verizon-Bryant College Telecommunications Center
Bryant College

Dennis McCarthy, Manager
Global Link Program
Bryant College

As we move forward into the Millenium, the many opportunities available for utilizing technology mediums in education is significantly increasing. At the same time, the technology is not the primary factor in the development of a Distance Learning System. Consideration must be made to address the learners, the content, organizational setting, process people, and the technology. These components are critical to creating a successful Distance Learning System. "Only through careful planning and implementation based on the idea of the distance learning context as a system in itself rather than an add-on to an existing system can an organization maximize the benefits of distance learning." (Chute, Thompson, Hancock, 1999)

This paper will examine how the Bryant College Videoconferencing Staff and the Verizon-Bryant College Telecommunications Center developed a distance learning project to enhance learning between two high schools in the United States and England. The intent is to address the Distance Learning System components and the process and development that followed in coordinating this distance learning experience.

Implementing the Distance Learning System

Implementing a Distance Learning System using the five component parts discussed above does not guarantee optimal learning but it does improve the chances for success. Each of these components is dynamic. Constant monitoring is required in order to coordinate the integration of all resources. Outside forces may effect various components of the system, therefore, periodic assessments should be planned to keep everyone working toward the same objectives.

Implementing a Distance Learning System, as defined by Chute, Thompson, and Hancock, 1999, is a very complex process with ample room for error. The project's success will hinge directly on the level of preparation, planning and communication undertaken. The characteristics of each component part will vary by project. The process people will need to customize and adapt elements of the system to ensure the climate for learning is optimal. In some cases, the characteristics of the component parts may not be suitable to initiate a distance learning project.

For our example, we will examine the component parts of a Distance Learning System that proposes to teach students about various economic principals through a teen consumer price index project. This project was based on a concept developed by the Foundation for Teaching Economics (www.fte.org.) And, it was managed by the Bryant College Global Awareness Program, which is funded through a grant from the Verizon Foundation. Our intent was to develop a project that could be handed down to future classes of students. A second objective of this project was to broaden the students' perspective of diverse people, cultures and a global economy.

In brief, two classes of high school students, one from Rhode Island and the second from England agreed to track the price changes of goods and services that teens typically purchase. They first agreed upon a market basket of 70 goods and services. Students were broken up into teams by product category and told to collect prices on a bi-weekly basis. Prices were collected in the field, posted to a spread sheet, displayed on a web site (www.liteprogram.net/tcpi,) and monitored for changes. Each teacher discussed economic principals such as supply and demand, consumer spending, savings, and the overall health of the economy with their students.

Following is a discussion about the characteristics of each of the components of the Distance Learning System. We will examine these component parts individually and their relationship to one another in the context of a Distance Learning System. Both the positive and negative effects of these components on one another will be revealed. It will become apparent that the outcome of a distance learning project may be effected after careful consideration of each of these components.

Learners

Notable characteristics of the learners include differences with age, cultural backgrounds, and their experience using technology. The Rhode Island students' (RIS) average age was about two years younger that the English school students (ES.) With fewer life's experiences and practice with technology the process people needed to take special steps to prepare the RIS for this project. Fundamental principals of economics needed to be addressed as well as hands-on experience using MS Excel spreadsheets and concepts dealing with web site design. A videoconference was conducted to introduce the learners to one another. At this time the learners were able to get to know one another and come to understand their cultural differences and similarities. Learners developed team building skills as they were broken up into groups and a team captain was assigned.

Process People

In our example we had a lot of process people to facilitate this project. From Bryant College we had two primary manages and two technology support staff. From the school in Rhode Island we had the teacher. From the school in England we had the teacher and the principal.

Everyone in this group had a job to do and the challenge was to coordinate these "process people" so that students could exploit the Distance Learning System and learn about economic principals. On the one hand we had teachers who knew a lot about economic principals but who had no experience teaching at a distance. On the other hand we had support personnel who understood the Distance Learning System but who didn't know a lot about economic principals.

The two primary manages were to facilitate communication between the process people and drive the teachers to use technology in the content delivery. The technology support team solicited web site design ideas from the learners and they built and maintained the web site. The teachers helped the students to break up into teams, narrow down the market basket of goods, dispatch students to collect prices and deliver a lesson plan to students on economic principals. The school in England's administrator provided logistical and moral support to the teacher in England.

Communication between the process people was facilitated through email, via audio conference, videoconference, and finally through a list serv. Some people had trouble subscribing to the list serv so communication was delayed at times. Another problem with communication came when both of the email addresses of the teacher in England were not working. Compounding this was this teacher's limited availability, due to competing responsibilities, to respond to issues in a timely manner. Having a second contact at the English School, in the administrator, helped us to overcome some of these problems.

Content

The purpose of this project was to teach students about economic principals through the construction of a Teen Consumer Price Index. This lesson was enhanced through this Distance Learning System as students were able to compare and contrast pricing variability of goods in different economies. Market forces in each country vary and were examined as a result of this project.

The methods chosen to convey content were selected to address the learning styles of each of the learners. Printed matter, videoconferences, traditional platform presentations, and a web site were all used to appeal to the students' learning aptitudes. Our intent to migrate the lessons from the classroom to the distance learning system did not always work. This was due to three reasons: 1.) Communication with the teacher in England was limited. 2.) the English teacher's availability was intermittent and 3.) the English teacher's students were enrolled in the project as an extra curricula project and not as a required assignment for a scheduled class.

At the outset we believed that we choose the proper mix of technologies to execute this distance learning system. In the end, despite remedial training, we believe the technologies chosen to facilitate local and remote learning were overwhelming for the learners. Contributing factors included limitations of the organizational setting and lack of experience using technology in a distance learning setting.

Organizational Setting

The organizational context or setting for this project involved a purely educational environment. This setting featured students enrolled in two publicly funded secondary education schools. This setting is the most conducive to encouraging the usage of various technology tools in the learning process. In this example, one class of students was studying the principals of economics as a required part of their curriculum. The second group undertook the project as an extra study project. The communication and level of commitment from the group working on the project as an extra study project seemed to be less than the first group.

The second aspect of organizational setting involves the efforts and resources offered through the organization to support the training program. This includes the extent to which the program has been accepted and supported by the leadership of the organization. Leadership decisions relating to the placement of a distance learning program within the overall structure of the organization will influence the attitudes of all those in the organization who are affected by the program. (Chute, Thompson, Hancock, 1999)

Educators in schools new to distance learning may be unsure of what's needed to support this new teaching method. They must be prepared and advised of changes that create a supportive environment. In this example, the Rhode Island students were not permitted to use the Internet for emailing between the students in England without their parents' permission. Obtaining permission slips delayed and in some cases suspended communication and learning.

Technology

The characteristics and needs of the learners, the content, the organizational context, and the process people in the educational and project development system all need to be considered when making a decision on technology. The concept of developing a distance learning project based on the technology is one that an organization should avoid.

The technology used in this project included a list serv for the process people to actively communicate, a web site for the exchange of information and videoconferencing for the real-time communication of team ideas and cultural exchanges. The decision to use these technologies was made based on the learner needs as well as the availability of technology resources. However, a thorough review of the learner and process people's experience with technology was not completed. This limitation effected the use of some technology and the conveyance of lessons between students. The students at both locations were not experienced with the MS Excel application and therefore required introductory training on the software. This impeded the process of posting data to the web site and led teachers to present content using traditional means.

Concluding Remarks

At the conclusion of the project the process people deemed the exercise a success because students gained a greater awareness of the economic principals addressed and they gained a greater awareness of students from a different country. Both schools' teachers were credited with delivering the content to their students but the knowledge creation through the Distance Learning System was limited. The results of this project within the context of the Distance Learning System provided many lessons learned for the process people and learners.

Careful planning and preparation when establishing a distance learning project may be the most important step in ensuring its success. The process people must define their roles and ensure that regular communication takes place. Careful consideration must be given to selecting which technology is used to facilitate the learning and the process people must have a base line understanding of these tools. A learner profile would be helpful and should include the students' age, proficiency using technology, and experience working in teams. Lastly, students enrolled in a distance learning project as an extra study project may be less committed to the project than students enrolled as a part of their required curriculum. With other academic or social responsibilities, these extra study students may invest less time in the distance learning project than in other activities.

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Biographical Sketches

Stacie Brigido has recently completed a Masters of Arts in Adult Training and Development from the University of RI in May 2001. Stacie was employed as a Distance Learning Consultant for the National Guard Bureau on a National Distributed Training and Technology Program and as a Distance Learning Producer for Metropolitan Life Insurance Company. She is currently the Director of the Bryant Verizon Telecommunication's Center. The Center works to provide student development opportunities by offering seminars and individualized consulting services to small business and K-12 clients. Stacie has presented at a National Air Guard Conference in December of 1999 on Distance Learning Systems. In October 2000 and April 2001, she presented at Bryant College on the topic of Distance Learning and Instructional Design.

Address: 1150 Douglas Pike, Smithfield, RI 02917
E-mail: Sbrigido@bryant.edu
URL: web.bryant.edu/~verizon
Phone: (401) 232-0220
Fax: (401) 232-0242

Dennis McCarthy is the Global Link Manager at the John H. Chafee Center for International Business at Bryant College. Dennis McCarthy works to integrate videoconferencing and other electronic tools into the lives of people from primary and secondary education, higher education, and private industry. He has co-managed the Verizon Foundation funded Global Awareness Program since 1997. Through the Global Awareness Program Dennis has worked with over 400 students and 250 educators since 1995 in various projects involving videoconferencing. The primary and secondary education community in Rhode Island has come to value Dennis' experience and the resources of Bryant College as a partner in the development of new programs and towards the development of a statewide video network. Dennis also co-founded a videoconferencing association, which addresses technical and programmatic issues for professionals within private industry, government, health care, higher education, and primary and secondary education.

Address: 1150 Douglas Pike, Smithfield, RI 02917
E-mail: denmccar@bryant.edu
URL: www.rieac.org.video.htm
Phone: (401) 232-6525
Fax: (401) 232-6416

Making Connections: We Videoconference K-12

MaryAnn Butler-Pearson, Ed.D.
Distance Learning Coordinator
Broward County Public Schools, Florida

Background and History of Videoconferencing in Broward County

Broward County, Florida uses the videoconferencing medium to bring academic classes and programs, field trips and special events to thousands of students in its elementary, middle and high schools as well as adult education centers and centers for children with special needs. Videoconferencing was introduced in Broward County in 1997, as just one method of providing equitable educational opportunities to students in this geographically large, culturally and economically diverse school system. Teachers and administrators have also benefited form this format through staff development opportunities and informational meetings. The videoconferenced programs have become so popular that the district has purchased a 32-port videobridge for multipoint conferences.

The **Broward Education Communications Network (BECON)**, the district's educational communication network, is the hub for the videoconferencing initiative. As of April 2001, all 25 high schools, 16 middle schools, 20 elementary schools and 8 adult and special centers, as well as several district offices are equipped with group videoconferencing units that communicate at a minimum of 384kbps. The initiative is called DIMENSIONS because of the many current and future facets involved in distance learning.

Institutional Design

The formation of a consortium which included school district personnel with participation from the local higher education institutions, communications company, and equipment vendors was essential. The consortium still continues as a thriving organization with over 100 members. Once the most appropriate type of equipment was determined, sites were established to take part in pilot programs of various kinds. Training in both the technical operation of videoconferencing equipment and best teaching practices for videoconferenced learning opportunities was accomplished though the district's department of Human Resources and Development. Evaluation is an ongoing process, with attention to attitudinal as well as statistical analysis. District and school needs assessments play an important role in determining the nature of classes and academic programs initiated each school year. Many challenges have been met and others continue to surface. However, the bridging of time and space have become commonplace for the Distance Learning Department at **BECON**.

Academics

Academics in the elementary and middle schools consist of weekly interactive programs that assist the classroom teachers through motivating the students and demonstrating model lessons for the teachers. *Reading Rascals* is designed to increase interest in reading through books about the many cultures that influence the American society and the use of guest readers who highlight their careers and invite the children to ask questions about the work that they do. *Windows on the World* brings natives from many countries and cultures to visit with children in all grades. Students have the opportunity to ask questions about the country represented and learn first hand about its culture. *Writing With A Florida Flair* teaches elementary and middle school students the correct format for writing narratives similar to those that will be assessed on the state's competency exams. Another program that works with teachers and students in their preparation for the standardized tests is *Math With Mr. G*. Geometry is introduced to children in the 5th grade and math skills are reviewed to promote higher success rates on the state exams. Science is made fun with *Science Explorers*. Students and their teachers explore the Earth and beyond. These programs have become so popular, that to maintain the desired amount of interactivity, some are repeated each week so the number of participating schools can be limited to 5 or 6 for each program.

Students on site and at remote locations study geometry with "MR. G."

A research class for 8th grade students affords them the opportunity to earn 1/2 of a high school credit while learning science facts and skills that will help them be successful in the higher-level science courses they will take when they get to high school. Middle school students also receive weekly assistance with topics that will appear on the State of Florida's assessment test, the FCAT.

The scope of available courses in the high schools varies due to the nature and size of the student populations and the expertise and certifications of the teachers. In addition to providing classes for students who otherwise would be unable to take them, videoconferencing provides staff development opportunities for teachers. For example, when the facilitating teacher at a remote site is certified in the subject area but lacks the experience or confidence to teach at the Advanced Placement (AP) level, he is able to mentor under a highly successful AP teacher at the instructional school. In this way, the district is building a cadre of teachers for these high level classes. To date, 21 classes for high school students have been taught to students in AP and dual enrollment classes as well as regular level classes. Review sessions for the national AP exams are designed and lead by some of the district's most successful AP teachers.

Unique Projects

Using grant funding, one of the vocational/technical centers in the district placed videoconferencing units in the homes of 6 people with physical handicaps too severe to permit them to take classes at school. These individuals connected to a microcomputer lab at the school and learned an office administration program along with students on-site. Each earned certification from the vocational/technical center that will help them find gainful employment they can do from home. A center for students with severe emotional problems was able to offer Spanish to its students through videoconferencing. More innovative uses for the technology are planned for the next school year.

Ms. Valerie Arena's videoconferenced Advanced Placement Literature class now benefits students at district high schools where the course had not previously been available to students. The 1999-2000 passing rate was 98% for Ms. Arena's students.

Field Trips

Students at all levels have been given the opportunity to travel to various parts of the United States, Europe and Asia. The SAXOphone Project (Students All Over the World Exchanging Over the Phone), an enterprise Broward County shares with Nova Southeastern University and New York's BOCES, has brought together students and teachers in Broward County with their counterparts in several other states, England, Sweden, Norway, Germany and Japan. These field trips take students to places like the Johnson Space Center in Houston, Texas, behind the scenes at the Broward Center for Performing Arts, the Mote Marine Science Institute in Sarasota, Florida, and the Urayasu Folk Museum in Japan.

Broward County students meet their counterparts in Urayasu, Japan while they tour the Urayasu Folk Museum during a videoconference.

Special Events

Students at various schools have had the opportunity to participate in debates on hot topics such as violence in our schools and the death penalty. Among others, they have interviewed a producer/director in California, a survivor of the Holocaust, players for one of the professional sports teams in South Florida. One of the most exciting recent events was an informal concert given by a world-renowned Japanese Shakuhachi musician from his studio outside of Tokyo. A jazz musician of Japanese decent who lives in Florida played the vibraphone at the **BECON** facility. Each musician played separately and then, as musicians often do, they began to jam which thrilled the audience.

Through the generosity of the Lucent Links Foundation, which funded the school district's "West... Meet East" project, a series of 12 videoconferences have been help between high school students in Broward County, Florida and Chiba, Japan. The students shared fashion preferences, prices for everyday items, music, dance and martial arts demonstrations, just to name a few of the topics. Students from outside Florida were also invited to attend the programs.

On December 16, 2000, some elementary school students from Broward County Schools learned a song for world peace. Composed by a teacher in Spain, "The Millennium Song" was translated into over 56 languages and posted on the Internet. Not only did Broward students learn the song, but so did students in elementary schools around the world! At 3:00 a.m., Eastern Standard Time, the children in Broward County, Florida were videoconferenced with children in Spain, Kenya, Norway, Australia and Japan. This videoconference linked children on FIVE continents in the name of World Peace!

Staff Development and Administrative Use

Curriculum department, principals' meetings, and other administrative activities conducted through videoconferencing have saved the district money and the participants' precious time away form their offices and schools. School to Career staff, teachers of the gifted, and area advisory councils are just some of the groups who have used the technology to meet interactively, in real time. District Curriculum Supervisors use videoconferencing for their monthly meetings with curriculum department chairpersons located at the district's high schools and middle schools. Over 1,200 teachers new to the district participated in the required orientation program for new teachers. Using videoconferencing, district teachers seeking National Board Certification have shared training activities and collaboration with teachers in 5 other districts in the state.

Teachers share ideas and expertise during district staff development workshop

Where Do We Go From Here?

The future for videoconferencing in Broward County Schools is limitless! Pilot programs integrating it with other electronic media such as the Internet, microwave transmission, and regular broadcast television have been successful, paving the way to enhanced learning opportunities for the teachers and students in the community. The Distance Learning Department at **BECON** is always looking for exciting possibilities and new partners in offering educational opportunities to Broward County students and their counterparts, wherever they are. Collaboration and sharing are the keywords in distance education!

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Biographical Sketch

MaryAnn Butler-Pearson, Ed.D., is the Distance Learning Coordinator for Broward County Schools, Florida, the fifth largest, fully accredited school system in the United States. She also serves as president of the Florida Distance Learning Association. Her presentations have been well received at various national and international distance learning conferences, including events in Japan and South Africa.

Address: 6600 SW Nova Drive
Ft. Lauderdale, FL 33317
Phone: (954) 370-8364
ISDN: (954) 370-9339B
E-mail: butlerp@nova.edu

Creating Engaging Online Instruction

Richard Chamberlain
Associate Director
Center for the Application of Information Technologies
Western Illinois University

Dr. Charalambos Vrasidas
Coordinator of Research and Evaluation
Center for the Application of Information Technologies
Western Illinois University

Increased use of technology and the Internet are beginning to blur the line between traditional face-to-face and distance education. Schools of all levels are recognizing the power of the Internet and are exploring ways to make education available to students of all ages. However, one of the criticisms that often come up in discussions of online learning is that it is passive and not as valuable as learning that takes place in face-to-face classrooms. Another criticism of online education is that instruction delivered via text-based computer conferencing lacks the visual and audible cues of communication that are present in face-to-face situations. Therefore, according to critics, online education cannot be as effective and efficient as education offered in face-to-face classroom settings.

During this presentation we will illustrate different strategies that can be employed in creating engaging online classes. We will use concrete examples from online classes we developed for high school students as well as for undergraduate and graduate level college audiences. Particular emphasis will be placed on how to transform online learning from "text on the screen" to a powerful engaging and interactive learning experience. Educators and instructional designers need to understand the capabilities and limitations of the web environment and the process that needs to be followed to successfully adapt existing curricula to the online environment.

Engaged Learning

Jones, Valdez, Nowakowski, and Rasmussen, (1994) have identified several indicators of engaged learning:

- In engaged learning students are responsible for their own learning and they collaborate with their peers.
- Tasks for engaged learning are challenging, authentic, and interdisciplinary.
- Assessment is performance based, generative, and interwoven with curriculum and instruction.
- Instructional models are interactive and generative.
- Learning contexts are based on communities that are collaborative and empathetic.
- Groupings of students are heterogeneous, flexible, and equitable.
- The student is the explorer, apprentice, and co-constructor of knowledge.
- The teacher is the facilitator, the guide, and co-investigator.

The idea of engaged learning derives from constructivist learning theories, which argue for learners that are actively engaged in meaningful tasks. Learners are self-regulated, responsible individuals who can identify goals and solve problems alone and in collaboration with others. The tasks assigned in engaged learning settings are authentic, multidisciplinary, and grounded in real world settings, thus making them meaningful to the learner. Assessment of learning is ongoing and based on multiple ways for evaluating learners.

Learning is interactive when learners are actively engaged in a variety of activities, and along with their peers and teacher, they are co-constructors of knowledge. The learning environment provides a sense of a learning community within which participants collaborate with others to negotiate and share meanings. The teacher is the facilitator in this community of learners, whereas students are the explorers.

Communication technologies enable educators and instructional designers to design and develop engaged learning environments. In the following section, we discuss how, based on the capabilities and affordances of communication technologies, we have chosen the instructional strategies we used for online instruction in specific online courses we developed. We show the evolution of the course development process by demonstrating concrete examples of online classes and discussing in detail the various steps of the process. We discuss the choices we made regarding the interactive components of online courses such as navigation options, reflective journals, individual student profiles, online discussions, collaborative activities, and interactive quizzes. Furthermore, we will demonstrate and discuss the appropriateness of using Flash technology and database-driven web-based interaction and address the development and production hurdles such technologies involve.

Discussion of Concrete Examples

One of the classes we developed is Consumer Education, which was delivered online for high school students of the Large Unified District Association in the state of Illinois. This class was selected to be offered online for several reasons. First, all high school students in the state of Illinois have to take a consumer education course in order to graduate. Therefore, such a class delivered online was likely to have a large audience. Second, teachers we worked with indicated to us that this was one of the most "boring" courses in their curriculum and they wanted to take up the challenge and work with us to make this interesting, engaging, and deliver it over the web. Third and most importantly, developing this course online offers another alternative to students, who because of scheduling limitations and place and time constraints, cannot attend the traditional face-to-face class.

The Web offers unique opportunities for teachers and learners. At the same time, it also presents certain challenges. The key to creating effective online instruction is to utilize those characteristics of the Web, which are appropriate for the instructional objectives of a class and the intended audience. From a technological standpoint, the interactive nature of the web and its multimedia nature allow for the development of engaging instruction.

One of the major challenges of our project was to work with content, which according to the teachers serving as the content experts, was not engaging and interesting for the learner as it was offered in the traditional classroom setting. In an attempt to make this course engaging, we employed a number of techniques. Considering the interactive and multimedia nature of the Internet, we made a list of possible activities and models we could use in the online environment. In selecting these activities, we first demonstrated to the content experts examples of online classes and activities appropriate for the online environment. Classes we demonstrated were not only of high school level (e.g., AP Calculus) but also of college level (e.g. ITT534-Issues in Instructional Technology). Then we tried to identify those activities that we felt will be appropriate for this age level and content domain. After long discussions and prototype developments, we have selected to include activities and employ strategies discussed below.

One of the issues we struggled with was how much control to give the learner in the online environment. Structure is crucial in learning environments and it is particularly more important in the online environment (Vrasidas, 2000; Vrasidas & McIsaac, 2000). In the Consumer Education course, we decided to structure activities in a way that one builds on the other. Therefore, the learner has to complete the activities and cover the content in a structured fashion. Since this was one of our first online classes at the high school level, we decided to have it as structured as possible, without violating the principles of engaged and constructivist learning. The class consists of 10 units. Each unit has a number of lessons that range from 3 and 6. Students have to complete all activities in lesson 1 before moving to lesson 2. In order to have the site structured in such a way, we developed a database driven course that requires students to log on and proceed in a structured manner.

The internet provides an endless source for information on virtually any topic. In an attempt to take advantage of the wealth of information available online, we designed activities that require learners to take the role of an explorer and visit several websites in order to gather information about topics and assignments on health insurance, taxes, finding a job, credit, etc. Learners, after visiting other sites, return to the class site and, using online forms, submit their work and findings to the teacher. All student submissions are automatically stored in the database. At the end of each unit and when appropriate, there are reflective journal activities where the student reflects on what she learned and how the knowledge she gained helps her be an informed consumer.

In addition, there are several discussion questions, which ask the students to think about critical issues on consumer education and discuss them with their peers and the teacher. For example, in the lesson on credit, students are presented with a scenario in which a young lady purchased from an online store a CD player that is not working properly. In an attempt to resolve this matter, she failed to follow the steps necessary, and the case was taken to court. Students are asked to take sites (student versus store owner) and present arguments and discuss online how to resolve this issue. The specific requirements for participation in online discussion were structured ahead of time and made explicit by the teacher. Every student had to participate at least twice in each unit's discussion topic. Students were required to respond once to the question posted online and once to a contribution made by one of their peers. Requiring participation ensured that students would engage in discussion with their peers.

An issue we had to deal with was to ensure students receive prompt feedback on their contributions and submitted work. Feedback has been associated with kinds of responses that provide information to students about the correctness of their assignments, homework, and class contributions. In distance education feedback is more important than just a mechanism of informing the student on how well she did on an assignment. In face-to-face situations nonverbal gestures are constantly exchanged thus providing both the teacher and learners with feedback. In the online environment, however, you lose all the contextual cues of communication, which are important in creating the feeling of social presence. Vrasidas and McIsaac (1999) conducted a study to examine the factors influencing interaction in an online course. One of the major findings of the study was that the lack of immediate feedback contributed to the feeling of isolation among students. To address this issue, we also developed several interactive quizzes and practice sessions which asked the student to respond to questions and get instant feedback. Furthermore, we tried to make the grading and teacher/learner communication easy by employing database technologies. The student's responses are stored in a database, and made available for the teacher in an organized manner. Once an activity was submitted, all information entered the database-driven gradebook. There, the teacher can view all assignments completed by the students, grade them, and provide feedback to the student.

The multimedia nature of the web allows educators to develop online curricula that transcend the traditional text-based correspondence model of delivering distance education. Animations were used to illustrate several concepts that relate to consumer education. For example, we used Flash technology to develop interactive animations illustrating how to file your taxes. Then, we developed the tax forms, allowing the students to practice filing taxes, giving a real world scenario. In another class we developed for college level students and with the title "Introduction to Geology," we developed Flash animations that illustrate volcanic phenomena and what actually takes place beneath the earth as a volcano is ready to erupt. One limitation of using Flash technology is that bandwidth intensive multimedia content is not yet a widely used standard and slow Internet connection speeds discourage users. Furthermore, users will need to have installed on their computer the Flash plug-in in order to view the content.

In addition to the online activities, we incorporated several offline activities. Engaged learning in an online class should not rely solely on the student interaction with the computer. Research in distance education has identified four kinds of interaction: learner-teacher, learner-learner, learner-content, and learner interface interaction (Hillman, Willis, & Gunawardena 1994; Moore, 1989). Students can be engaged learners by participating in a variety of activities that are offline. For example, in the Consumer Education class, students had to visit a local bank and talk to a banker about opening an account, different kinds of accounts, loans, interest rates, etc. They had to visit a local grocery store to complete an activity on comparison shopping. They had to interview members of their family or neighbors regarding credit card problems they had to deal with and how they resolved them.

Conclusion

Designing online courses is not as easy as it is often argued. It takes time, resources, and requires an understanding of the content domain as well as the online environment. Educators are often asked, and at times required, to develop online classes. We have briefly provided a few examples of strategies that can be employed for facilitating engaged online learning. We are currently implementing a large-scale evaluation of online courses we developed and the online course development process itself. Within the next few months the findings will be available on our web-site at http://www.cait.org

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Biographical Sketches

Richard Chamberlain is Associate Director of the Center for the Application of Information Technologies at Western Illinois University. He has been involved in multimedia development and distance education for the last 15 years. He has given numerous presentations and workshops at national and international conferences.

Address: 101 Horrabin Hall
Macomb, Illinois 61455
E-mail: RChamberlain@cait.org
URL: http://www.cait.org/
Phone: (309) 298-1804
Fax: (309) 298-2806

Charalambos Vrasidas is Assistant Director for Distance Learning and Coordinator of Research and Evaluation at the Center for the Application of Information Technologies at Western Illinois University. He has been involved in distance education for the last 10 years. He has conducted research in the areas of distance education, online learning environments, and technology integration. He is currently evaluating virtual high school projects and online professional development programs funded by the U.S. Department of Education. Links to these projects can be found at http://www.cait.org/vrasidas

Address: 101 Horrabin Hall
Macomb, Illinois 61455
E-mail: vrasidas@cait.org
URL: http://www.cait.org/vrasidas/
Phone: (309) 298-1804
Fax: (309) 298-2806

Conducting Learner Analysis to Adjust Online Instruction for Your Faceless Learners

Seung Youn (Yonnie) Chyung, Ed.D
Visiting Assistant Professor
Instructional & Performance Technology
College of Engineering
Boise State University

Online Distance Education

Distance education is defined as "any formal approach to learning in which a majority of the instruction occurs while educator and learner are at a distance from one another" (Verduin & Clark, 1991, p. 8). Various technologies are used as the delivery media in distance education. Education or training courses can be delivered to remote locations "via audio, video, or computer technologies including both synchronous and asynchronous instruction" (NECS, 1999). Since the early 1990s, asynchronously delivered Internet-based online distance education has, due to its time and geographic flexibility, appealed to working adult learners who work full-time and hope to participate in continuous education as part-time students. According to the NCES's statistical annual report (1999), the Internet technology is one of the fastest growing delivery modes for postsecondary distance education.

Fighting the Drop-out Problem

A problem in adult distance education has been a high turnover in enrollment. Retention of distance education learners is known to be usually lower than retention of on-campus learners (Kember, 1995; Verduin & Clark, 1991). Kember (1995) reports that within a course, attrition is much higher at the beginning of the course than towards the end of the course. The steep attrition slope is also shown within an entire online degree program – i.e., more students drop out of the online degree program after the first couple of online courses than after they have taken a number of online courses (Fenner, 1998, 2000).

What Causes Dropouts? - Theory into Practice

If adult learners find online distance education as a convenient method to reach their goals of learning, why would they drop out of the online course or online degree program before completing them? Reasons for dropouts are found to be various. It has been reported in the distance education literature that adult learners tend to drop out of distance education courses or programs when:

- They perceive that their interests and the course structure do not match (Bartles, 1982 cited in McCreary 1990; Fenner, 1998).
- They are not confident enough in learning in distance environments (Chacon-Duque, 1987).
- They have learned what they wanted and they lost motivation to continue to learn (Holmberg, 1989 cited in Verduin & Clark, 1991).

The above factors have been found to be the causes for dropouts in online distance education as well (Chyung, 1999, 2001). More specifically, online learners tend to drop out when they perceive that:

- Online learning environment and instructional presentations are not **attractive** to them,
- What they learn from the online instruction is not **relevant** to their interests or goals,
- They are not **confident** enough to become a successful online learner, and
- They have low **satisfaction** levels toward the online learning environment.

The above four factors (attention, relevance, confidence, and satisfaction) are discussed in John Keller's ARCS model (Keller, 1987). Keller explains that the four factors influence the degree of learners' motivation to learn. Keller argues that in order to help learners become motivated to learn, instructors should consider improving the motivational appeal of the instruction by focusing on the four factors.

How Do We Design Online Instruction to Be Appealing to Learners?
Start with Learner Analyses

A way to reduce the number of dropouts of online learners is to restructure the online instructional system based on the four motivational factors and to provide motivationally appealing online instruction to learners. However, one of the difficulties in designing motivationally appealing online instruction is that the online learning environments are often asynchronous and faceless. Instructors do not see their online learners, even when learners feel alone, lost, overwhelmed, bored, dehumanized, and dissatisfied. Those learners are at risk of quitting, which contributes to the high dropout rate found in online distance education unless timely and effective interventions are implemented. Therefore, it is very critical to conduct ongoing learner analyses and implement systemic and just-in-time interventions.

Conducting Learner Analyses

The ARCS model is an effective guideline for online instructors who wish to conduct learner analysis and modify their online instruction to improve its motivational appeal to individual learners. The information presented in the following section is based on the author's years of experience in designing graduate-level online courses at Boise State University and her success in delivering motivationally appealing online instruction to adult learners and reducing the dropout rate (Chyung, 1999, 2001).

Tools for Assessing Online Learners

Adjusting online instruction for learners does not mean just changing instructional information. It means systemically restructuring the instructional system. One of the first steps is to conduct learner analyses. The most important principle in conducing learner analyses is not to assume anything about your learners unless you have a well-established norm for the particular learner population. Before and as soon as a semester starts, try to learn as much as you can about your online learners. You may focus on three major categories when conducting learner analyses: technical status, cognitive status, and affective status. For example, some of your learners may tend to be confused by computer jargon and frustrated by their inability to follow complicated technical steps. Learners' entry-knowledge levels can also vary. There may be novice learners while there are some advanced learners who already have relevant background knowledge and skills. Remember that online classrooms are not just for cognitive development; they are also emotional and social environments. Help your learners perceive that they are in a non-threatening and rewarding learning env0ironment. Table 1 is a summary of the assessment categories and methods, and the data about characteristics of your online learners that you may obtain from initial learner analyses.

Based upon the data you obtained from your initial learner analyses, carefully design and implement appropriate intervention strategies. Remember that your interventions are targeted at improving and maintaining *the motivational appeal* of your online instruction by providing more adaptive instruction to your learners, and ultimately reducing the number of dropouts. Therefore, you should conduct an ongoing process of analyses and implementations throughout the course of instruction.

Table 1. Assessment Categories, Data, and Methods.

Category of Assessment	**Data to Obtain**	**Assessment Methods**
Online Learners' Technical Status	• Technical equipment currently available to each learner • Online learners' current technical knowledge and skills	• Equipment availability checklist, e.g., http://coen/boisestate/edu/dep/ipt/de_checklist.htm • Technical training (see Winiecki & Chyung, 2000)
Online Learners' Cognitive Status	• Current knowledge level and confidence level toward the learning subject	• Entry-knowledge assessment • Confidence level assessment
Online Learners' Affective Status	• Learners' age, gender, previous educational background, previous online learning experience, professional background, family/cultural background, personal and professional interests, academic goals, behavioral tendencies (e.g., introvert or extrovert, current on-line behaviors, etc.	• Review of biographic profiles • Learning styles assessment: e.g., http://coen/boisestate/edu/dep/ipt/de_checklist.htm • Observations of online behavior • Ask them!

Implementing Intervention Strategies

Table 2 provides a summary of suggested intervention strategies to be implemented based on frequently exhibited characteristics of the first-time online learners. The third column of the table indicates the main targeted factor(s) to improve the motivational appeal of the online instruction (A: Attention, R: Relevance, C: Confidence, and S: Satisfaction).

Evaluating the Outcomes

The impact of the above interventions implemented in Boise State University's Master's degree online program has been significantly positive. The online program has significantly increased the student retention rate over the 3 year period (Chyung, 1999, 2001). More information about the evaluation outcomes will be described in the presentation.

Table 2. Online Interventions Strategies based on the ARCS Model.

Potential Learner Characteristics	**Suggested Intervention Strategies**	**Targeted Motivational Factors**			
		A	**R**	**C**	**S**
Learners are new to the online learning environment and they do not know how to behave in an online learning environment.	• Keep the size of your online class small (less than 17 students).			*	*
	• Provide examples of exemplary online behaviors and examples of undesirable online behaviors up front.		*	*	
	• Monitor individual learners' online behaviors and provide frequent feedback to reinforce good online behaviors and/or modify undesirable online behaviors. Avoid being evaluative; try to be supportive and specific in feedback.	*		*	
	• Provide a private online discussion area for each learner and the instructor so that the learner can easily contact the instructor and ask for advice privately. • Manage online communication conflict situations immediately and privately.	*		*	*
Learners are not knowledgeable of using the Internet-based media technology as a learning tool.	• Provide learners with a technical training program and help them master the basic technical skills prior to the first online class. • Provide ongoing technical support in a timely fashion.			*	*
Learners are new to the field (i.e., new to the learning subject matter).	• Provide structured and spiral instruction: easy to difficult, simple to complex, concrete to abstract.			*	*
	• Provide alternative assignments and have learners choose a method to accomplish a learning goal.	*	*		
Learners are different in terms of the entry knowledge levels.	• Conduct an entry knowledge assessment and use the data to adjust the level of difficulties in instruction for the learners. • Provide assignments that are not too easy, not too hard, but challenging enough for their entry knowledge levels.		*	*	
Learners have different personal, professional interests and goals.	• Obtain individual learners' demographic background information before and/or as soon as the semester starts. • Provide various examples during instruction that are relevant to the learners' interests and background.	*	*		*
Learners are goal-oriented.	• Provide clearly stated weekly goals and objectives and explain why it is important to achieve the goals. • Clearly state how learners will be evaluated.	*	*		

	• Provide specific guidance on how to successfully accomplish the goals. • Provide concrete and timely feedback on how they are doing.			*	*
Learners are highly achievement-oriented.	• Provide frequent and constructive feedback to learners on a regular basis and let them know how well they are doing.		*		*
	• Assign a special assignment (e.g., assign as a team leader or a discussion wrap-up person). • Return the result of the exam or the review of the term paper in a timely manner. • Publicly post exemplary answers or papers.	*	*		
Learners have different preferences in the types of learning.	• Provide various learning activities and multimedia components, and allow learners to select their preferred activities.	*	*		
Learners miss personal contact with the instructor.	• Make personal contact with each learner using a personal online discussion area, email and/or telephone. • Frequently address each learner with his or her name in online dialogues.	*			*
Learners miss social interactions with classmates	• Assign paired or group activities. • Encourage collaborative work. • Provide a virtual hallway area, a virtual congratulation bulletin board and a virtual student union area. • Encourage sharing their photos.	*			*

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Biographical Sketch

Seung Youn (Yonnie) Chyung (Ed.D) is Visiting Assistant Professor in the department of Instructional and Performance Technology at Boise State University (BSU). She teaches Graduate-level online courses as well as on-campus courses at BSU. Her current research interests include e-learning and knowledge management principles and practices.

Address: Instructional & Performance Technology
Boise State University
1910 University Dr.
Boise,ID 83725-2070
E-mail: ychyung@boisestate.edu
URL: http://coen.boisestate.edu/dep/ipt.htm
Phone: (208) 426-3091
Fax: (208) 426-1970

Instructional Design in Distance-Delivered Graduate Educational Programs: Summary Evaluation and Results ID Principles

Dan O Coldeway, Professor
Dakota State University

Mark Hawkes, Assistant Professor
Dakota State University

Graduate programs have emerged using distance educational methods and technology. This has given rise to an expanded view of instructional design. This presentation will present the results and interpretation of evaluation findings by designers and instructors in distance-delivered masters programs. A list of the resulting ID principles will be presented and discussed by both the presenters and analyzed by a discussant (Dr. Chere Gibson, University of Wisconsin-Madison). Audience input will conclude the session.

Graduate Programs have become increasingly popular to adult learners at a distance. The success of both academic and professional masters and doctoral programs appears to be well established, albeit typically by the programs own criteria and admission. Further research and evaluation is obviously important in this area and should be encouraged.

The Instructional Design Issues

The details of the instructional design processes for graduate educational program design and development have not been well articulated. Over the past three years, working independently in three graduate programs (two of which are reported on in this session) these authors have developed a set of ID principles that appear to have validity across program and content dimensions. Moreover, the results from course and program evaluation support the ID methods described in this presentation.

Background on the Two Types of Programs

The two programs used as cases for this presentation represent two approaches to both instructional design and instructional delivery. They are described in these generic terms:

A. Programs that use an institutionally supported infrastructures (e.g. Web CT) for on-line presentation of content in conjunction with outside materials (i.e. print, media, etc.)
B. Programs that use individual faculty course web sites as jump off points for on-line instructional functions in conjunction with outside resources as required.

In addition to the above, there are a set of more generic ID principles that are used to analyze content, structure instructional sequences, determine scheduling and foster student and faculty to student interaction. Although most of these functions can be handled well within each of the above two models, there are differences in approaches and methods of instructional preparation differs.

Instructional Design Methods and Principles

The following outline identifies the topics being presented and discussed in this presentation.

I. What is instructional design
II. Some common ID principles

III. Instructional Design methods
IV. Underlying Philosophical issues for graduate education ID work
V. The role of the instructional designer
VI. Other roles important to DE success
VII. Evaluation date used to access ID success
VIII. Basic course elements
IX. On-line course tools
X. Problems with On-line courses
XI. Factors beyond ID control

How to Design a DE Graduate Course

This section will identify the methods that we suggest based on the above experience of designing DE graduate courses and programs. Many of these factors seem to go beyond typical ID strategies and are viewed as more practical in nature. The following issues will be described and discussed:

A. Following basic ID principles
B. Building in interactivity
C. Creating visually appealing screens and pages
D. Making instructional clear
E. Keeping track of student performance
F. Providing learner support

(Note: Thanks are given to Dr. Greg Kearsely for his contributions to the last section of the presentation. Thanks are also given to the Master of Engineering Professional Development program faculty and staff and the Dakota State University College of Education for their valuable efforts in helping to refine and test methods for graduate educational delivery.)

Biographical Sketches

Dan O Coldeway, Ph.D., Professor, Dakota State University; interests lie in Instructional Systems and Design, and Distance Educational research.

Address: College of Education
Dakota State University
Madison, SD 57042
E-mail: dan.coldeway@dsu.edu
Phone: (605) 256-5855
Fax: (605) 256-7300

Mark Hawkes, Ph.D., Assistant Professor, Dakota State University; interests lie in instructional technology, educational evaluation and distance education.

Address: College of Education
Dakota State University
Madison, SD 57042
E-Mail: mark.hawkes@dsu.edu
Phone: (605) 256-5274
Fax: (605) 256-7300

Teaching Online, Outside the Box:
Developing Your Own Course Management System

Michael Collura
Instructional Technology Specialist
Purdue University

Matthew Mooney
World Wide Web Specialist
Purdue University

A Rationale for Developing Your Own System

Today, many distance-based courses are managed through out-of-the-box systems like WebCT or Blackboard's Course Info. But, what if you don't need all the functionality of those systems or the corresponding headaches and price tags that accompany them? What if you don't want the hassle of developing your courses to fit those systems? Many times individuals simply settle for those systems because that's what their campus has implemented and/or they think there is no other alternative. The tools we will present in this session dispel the idea that there's no other alternative. We discovered these methods as a result of searching for a course management system to help us manage our web-based Executive MBA program.

Through the use of the tools and methods demonstrated, course designers will be empowered to create an interface that fits their audience's needs rather than adapt their course to the system being used. Through the use of Microsoft PowerPoint and Access and Macromedia Dreamweaver UltraDev and Flash, anyone can create an online course site that meets his or her specific needs. In many cases you are already using these tools, or tools like them, to prepare your materials for said systems anyway.

Finally, our experience has led us to believe that, in many instances, the only tool individuals really want from those out-of-the-box systems is the discussion forum/bulletin board. We will demonstrate how individuals can still utilize those tools, if they are already in place on their campus, or use alternatives made specifically for that function. An alternative is a product called Web Board.

Customized System Components

User Access

One of the fundamental components of any course management system is the password-protected environment that secures access to the courses. This was the first obstacle to overcome and it was a rather simple one to solve. There are a number of methods one could use but we choose the User Authentication server behavior built into Macromedia Dreamweaver UltraDev 4 (referred to as UltraDev from this point forward). The feature allows you to create login pages that verify user names and passwords from any ODBC compliant database including Microsoft Access and SQL. In addition, if you are interested there are server behaviors that allow the students to register the first time they try to access the environment, allow them to choose their own user name and password, and verify that the user name is unique.

There are a number of reasons we chose to go this route. First, all this can be done with an Access database because it's ODBC compliant. This makes it very simple to setup and manage user data. In addition, if you have Microsoft Office you already have Access. Next, UltraDev creates Active Server Pages (ASP). ASP coding is processed on the server side and not by the web browser. Therefore, the user cannot view your code and cannot easily circumvent the login. Once the login page is created a simple tag on every other course related page secures them. Finally, by using this method when a student logs in, what's known as a session variable is created. In simple terms this is merely a variable that the browser remembers while its open. These session variables become useful when the student accesses the grade book and will be further explained later.

Course Pages

Another common hurdle that is overcome when using UltraDev is page design. Not only is page design and layout as simple as a common word processor in UltraDev, it is also quite easy to develop a design scheme that can be used consistently throughout a course(s).

The use of UltraDev Templates allows you to set up a common layout for each course page or all your courses. This Template can be applied to each page as your site grows. The true power of Templates is found in the site management. For example, if you need to change the copyright date or a common contact e-mail address that is found in a template, you can change it in the template and UltraDev will update all the pages that utilize that template.

In addition to basic layout and design, the use of Templates allows a developer to "lock" areas of a page and allow other areas to be editable. This allows a developer to design the structure and layout of a course and then let someone else provide the content without worry of accidental design changes.

Lectures

If you've ever used WebCT you know you can take a PowerPoint presentation and create a navigable lecture within the system. Do you know what WebCT actually does with those presentations? Basically it turns the slides into graphics and adds them to a page with a common set of navigation buttons. Well, within Dreamweaver is a feature that lets you create what it calls a Web Photo Album. What this feature does is create a series of pages out of pictures with navigation links between them. So, start with a PowerPoint presentation (if you have Microsoft Office you already have PowerPoint) and export the slides as GIFs. When you do this PowerPoint names the slides by number. Dreamweaver orders the Photo Album by file name alphabetically and/or using numbers. So, the pages will be in the proper order and already have the navigation built in. For the last step, so the slide names have some relevance, you will need to rename the slides in the table of contents once the album has been setup.

Next, in our lectures we include a streamed audio component with the slides. This may or may not be something you are interested in but we felt it was worth sharing. We record the file using the narration feature within PowerPoint. This allows the faculty member to record an explanation that complements each slide. Then, we convert the files to a streaming file format like Windows Media or Real Audio and we place the files on a streaming server. Most organizations have a streaming media server somewhere, whether at the departmental level or through an on-campus media center. The last step is to ad a link to each slide that links the corresponding streaming audio file.

Quizzes

On-line assessment of any kind has traditionally been a difficult accomplishment. However, we now have a number of options that make assessing a learner's progress on-line possible. While assessments using multiple choice, true/false, and matching offer the advantage of automated grading, the use of short answer and essay questions are still very possible. There are 2 basic levels of development for on-line assessment.

The most basic of these levels is to use simple HTML forms to collect data and either store it in a database to be evaluated at a later time, or to send the data to the instructor for evaluation. This is a quick and easy approach, but it lacks feedback and interaction on the part of the learner.

The next level would provide the learner with some feedback and simplify the work for the instructor. If there are portions of an assessment that are multiple choice, true/false, or matching, the server can evaluate the learner's responses, provide them with feedback and store the information in the database and/or send the results to the learn and instructor. While this seems very complex to think about, it is rather simple to create with basic If … Then logic. The possibilities are limited only by your imagination. The two levels mentioned above offer a great deal of flexibility.

Grades

Providing learners with access to their grades is another aspect of out-of-the-box systems. It is also surprisingly easy with UltraDev. As discussed above, securing your course based on username and password is a built-in feature of UltraDev. Remember the session variable that was set? Well, when the student clicks the grade book link the system knows what record to show based on those variables. Thus, it is easy to extract a specific record from the database that would hold a learner's grades.

Deciding how you want to get the grades in the database may be the most difficult part of the process. You can provide instructors with web-based grade books that would allow them to simply enter grades in their browser window and click the submit button. You can also allow them to upload a common or tab delimited file such as an Excel spreadsheet, which the system them uses to update the existing data in the database. Each method has advantages and disadvantages, but both are very useful.

The simplest solution is to have the instructor enter the grades through a web interface. However, with large classes this can become very tedious. The second solution requires the use of SQL and a bit more coding, but it very useful and powerful.

Other System Components

Discussion Forums

The one component that every online course system needs is some kind of threaded discussion or bulletin board system. Let's be frank, we could have put an enormous amount of time into development and created our own but there are products out there that do this well. One such product is called Web Board. Web Board was developed by O'Reilly but has recently been acquired by Chat Space. Web Board allows for online threaded discussion, has a built-in chat server, and is very customizable. An easy to use interface and the ability to authenticate users in a number of ways made it a perfect complement to our system.

E-Mail

E-mail might be the most important component of any distance-based program. The reality is that students already have an e-mail account from school or from an ISP. So why would do we try to give them another account? In addition, some system's e-mail is only internal and becomes more of a burden than a benefit to use or the system needs an outside mail server to function anyway. If students can use the e-mail they currently know and feel comfortable with it will eliminate any anxiety that often accompanies working with technology. Allowing them to use what they want eliminates the need to support an e-mail system on our part.

Biographical Sketches

Michael Collura holds an M.A.Ed. from the University of Akron and currently serves as the Instructional Technology Specialist for the web-based Executive MBA in Food and Agribusiness program at Purdue University. The EMBA is a joint degree offered in conjunction with Purdue's School of Agriculture and the world-renowned Krannert School of Management. The position involves leading the instructional computing and technical support for the program. This includes the administration of a web server, media server, and custom designed course management system. Responsibilities also include the development and maintenance of the program's web site, managing course delivery, planning and faculty development.

Address: Purdue University
Department of Agricultural Economics
1145 Krannert
West Lafayette, IN 47907-1145
E-mail: collura@agecon.purdue.edu
URL: http://www.emba-agbus.purdue.edu
Phone: (765) 494-9812
Fax: (765) 496-1224

Matthew Mooney holds an M.A. from Central Michigan University and currently works as the World Wide Web Specialist for Agricultural Economics at Purdue University. The position involves instructional technology training, support, and development for the department including multimedia development, database administration, and web development. Responsibilities also include web and media server administration. Mr. Mooney is currently working on his dissertation for his Ph.D. in Educational Technology at Purdue and has presented at a number of scholarly conferences.

Address: Purdue University
Department of Agricultural Economics
1145 Krannert
West Lafayette, IN 47907-1145
E-mail: mooney@agecon.purdue.edu
URL: http://www.agecon.purdue.edu
Phone: (765) 494-4253
Fax: (765) 494-9176

Involving the Deaf Community in Distance Teaching and Learning

Simone Conceição-Runlee
Instructional Design/Technology Consultant
University of Wisconsin-Milwaukee

Rosemary M. Lehman
Senior Outreach/Distance Education Specialist
University of Wisconsin-Extension

There are nearly 20 million deaf and hard of hearing individuals in the United States and 500 million worldwide. More than 43 million Americans have one or more physical or cognitive disabilities, a number that is increasing each year due to toxic noise. Historically, society has tended to isolate and segregate individuals with disabilities, and, despite some improvements, such forms of discrimination against individuals with disabilities continue to be a serious and pervasive problem, persisting in many areas.

In July of 1990, The Americans with Disabilities Act was signed into law by President George Bush. This Act provides a clear and comprehensive national mandate to provide consistent and enforceable standards to address any type of discrimination against individuals with disabilities. Later Acts, the Telecommunications Act, Section 508 of the Rehabilitation Act Amendments of 1998, and the Workforce Reinvestment Act, are more recent mandates that address technology accessibility and instructional design, requiring systems to be designed with accessibility built-in, where possible, for instructors and learners.

Little attention has been given to involving the deaf community in distance teaching and learning. The University of Wisconsin-Milwaukee (UWM) currently has the strongest program for teaching American Sign Language (ASL) as a foreign language in the state of Wisconsin. All of the teachers are native users of American Sign Language (ASL) and have certification from the National Certifying body of the American Sign Language Teachers Association. UWM offers four semesters of ASL and is currently expanding the program to offer two more semesters as well as a minor in ASL Studies. The University of Wisconsin-Madison (UW-Madison) is currently initiating proposals to accept ASL as a foreign language requirement. However, UW-Madison does not have a program for offering ASL. Therefore, a pilot project that would extend the UWM course to Madison learners was deemed to be beneficial.

Project Description

This project involved the design and development of an ASL course delivered via videoconferencing and web-based technologies between UWM and UWEX at the the Pyle Center in Madison. The course included three deaf faculty and staff. In addition to the synchronous and asynchronous nature of the course, "learning objects" of the ASL signs were developed and archived in a learning objects repository for future use. These learning objects will allow for customized modules to meet individual needs of future learners.

The purpose of this project was twofold, to: 1) design an ASL course to fit a distance teaching and learning mode, including the development of customized learning objects, and prepare deaf instructors for the integration of distance education technologies into curriculum redesign; and 2) implement a comprehensive evaluation of the project. The instructional design involved a series of procedures in developing each session of the course through innovative instructional activities. Instructor preparation was realized through training the instructors in the use of videoconferencing and web-based technologies for teaching at a distance. The overall project included three phases:

Phase One: Instructional Design and Instructor Preparation

This phase of the project involved course design and instructor training. Instructional design consisted of the development of course units, streaming video clips, and Blackboard Web-based course materials. Each unit was comprised of course objectives, readings, in-class activities, and assignments, which were also usable as customized learning objects for archiving and retrieval. An instructional designer facilitated the development of each unit by assisting instructors with the selection of format and instructional strategies. In addition, a streaming video consultant videotaped the major instructor and created video clips of signs placed them in a video streaming server and linked them to Blackboard. The video streaming component of the course was hosted through the University of Wisconsin-Stevens Point and the Blackboard server was hosted through UWM.

Instructor preparation involved a collaborative partnership between UWM and Instructional Communications Systems (ICS), University of Wisconsin-Extension (UWEX). ICS instructional design staff trained deaf instructors in the spring of 2001 to adapt the traditional ASL classroom course for teaching via the component technologies of videoconferencing and Blackboard. An intensive ICS spring training was offered via videoconferencing with Blackboard as the management tool and component technology. In this training instructors rehearsed the use of visuals and instructional strategies, using ASL.

Phase Two: Implementation, Monitoring, and Assessment

This phase involved the implementation, monitoring, and assessment of the course. Through the use of their new skills, the instructors provided a summer distance education course for learners in ASL. The summer course was taught point-to-point between UWM and The Pyle Center in Madison. Classes met three hours each week for seven weeks via videoconferencing with Blackboard serving as the course management tool and as a component technology for interaction. One of the trained instructors served as the major instructor at UWM and the other as the site coordinator at The Pyle Center site. Monitoring and assessment for outcomes and adaptation were designed and led by a deaf staff member from UW-Madison and a distance education specialist/instructional designer from ICS.

1. Both the overall project and the course were carefully monitored and assessed throughout. A comprehensive evaluation of the project was conducted including:
2. A pre-test and post-test for both instructors and learners.
3. Observation of interactions (learner-learner, instructor-learner, learner-materials, learner-technology, instructor-technology, learner-context, and instructor-context).
4. Observation of integrated software (software usage statistics).
5. Learner self-reflection about learning through journals.
6. Evaluation of technical and site personnel.
7. Overall course evaluation of the videoconferencing environment; Blackboard software; streaming video; facilities at both sites; learner knowledge through quizzes and discussions, and a final exam; and instructor self-evaluation of presentation.

Phase Three: Analysis of Findings and Implications for Practice

Data analysis and implications for future practice are being conducted to develop an effective model to share with other institutions statewide, nationally, and internationally.

This unique project has the potential to impact the education community as distance education technology for teaching and learning continues to advance. The outcomes of this project can serve as guiding principles for a more effective environment for ASL teachers and learners. By making administrators and policy makers aware of the requirements needed to provide a sound environment for teaching and learning, adequate logistical and administrative support can be provided in the future.

Course Title: American Sign Language I

Course Description: This course will focus on the natural acquisition of American Sign Language as a conversational language in an emersion-based learning environment. The development will focus on the everyday communication practices as demonstrated by the American Deaf people. Aspects of Deaf Culture will be incorporated into class activities as appropriate.

Course Sites: UW-Milwaukee School of Education and The Pyle Center

Course Dates: June 25; July 2, 9, 16, 23; and 30, and August 6, 2001; 5:00-8:00 pm.

Project Timeline

The project timeline includes spring training and course development; summer implementation, monitoring and assessment; and fall and winter data/information analysis and refinement.

Date	Description
March 2001	Videoconferencing training
March 2001 May-July 2001	Marketing campaign (course advertisement in listservs & mailing) Development of streaming video clips and learning objects
June 2001	Blackboard course design
June 2001	Beginning of course
June 2001	Pre-test (Send learners a letter in the beginning of June with instructions to take the pre-test via Blackboard.)
June-August 2001	Learners will complete reflective journals and quizzes after each Unit; participate in online discussions, and complete final exam.
June-August 2001	Class observations
August 6, 2001	Overall evaluation
August 13, 2001	Post-test evaluation
September 2001-June 2002	Data analysis and project report

Biographical Sketches

Simone Conceição-Runlee is an Instructional Design/Technology Consultant for the UW-Milwaukee School of Education, and holds a Ph.D. in Distance Education/Educational Technology and a Masters in Adult & Continuing Education. She recently co-authored *147 Practical Tips for Teaching Online Groups: Essentials of Web-Based Education* (2000, Atwood Press, Madison). Simone works with faculty providing training and consultation on instructional design and educational technology and has researched and contributed to many areas of good practice in online environments, as well as presented at numerous conferences.

Address: UW-Milwaukee School of Education
Enderis Hall
PO Box 413
Milwaukee, WI 53201

Rosemary Lehman is Senior Outreach/Distance Education Specialist at Instructional Communications Systems (ICS), University of Wisconsin-Extension (UWEX) at the Pyle Center, Madison, WI and holds a Ph.D. in Distance Education/Adult Learning and a Masters in Communications/Television. She is the author of *The Essential Videoconferencing Guide: 7 Keys to Success* (1996 and 2001, ICS, UWEX) and the owner/editor of the electronic newsletter, DESIEN. Rosemary has 29 years of experience in media production, design elements, training, materials publication, conference coordination, and conference presentations.

Address: Instructional Communcations Systems
University of Wisconsin-Extension
The Pyle Center
702 Langdon St.
Madison, WI 53706

Activities to Engage the Online Learner

Rita-Marie Conrad, Ph.D.. Assistant Professor
Florida State University

Ana Donaldson, Ed.D., Assistant Professor
Northern Iowa University

Nancy Nelson Knupfer, Ph.D., President
Digital Horizons

As course movement to the Web intensifies, effective instructional strategies that truly enhance online learning are increasingly needed. Leaders in the field of distance education, such as Draves (2000), Palloff and Pratt (1999 and 2001), Kearsley (2000), and Simonson, Smaldino, Albright, and Zvacek (2000), all agree that learner interaction is the key to an effective online course. Yet, how one moves from the traditional role of face-to-face instructor to online instructional coach and "Architect of Interactivity" has not been articulated clearly in the literature. The challenge facing online educators is to provide a bridge between the instructor's typical role and often-traditional classroom strategies to the new instructional role and pedagogical approach needed for effective online learning experiences. Engaging the learner in an online environment with interactive activities can be an effective solution.

The history of education is filled with instances where students and teachers focused on student-oriented learning, so engaged learning approaches and the concept of the "teacher as facilitator" are not new. John Dewey recognized the importance of the learner and the supportive role of the instructor in this country about a century ago. The emphasis of Dewey's pedagogical theory was focused on the learner along with the learner's importance within society. Dewey valued the teacher as a guide rather than a leading force. "Dewey had faith in teachers' professional judgment to a degree equaled by only a few of his peers and rarely exceeded to this day" (Tanner, 1997, p. 10). But the evolving technology has added a new twist to the pedagogical evolution.

While the new media offers a wealth of opportunity, it is typically employed in a non-interactive mode that tends to focus upon online lecture, creating a digital correspondence course instead of an effective online learning experience. Engaged learning on the other hand, stimulates the learners to actively participate in the learning situation, and thus gain the most knowledge from being a member of an online learning community. Currently there is some emerging knowledge about engaged learning and many activities that employ the Internet, but there has been very little written about the importance of engaged learning in online situations. Neither is there enough information to help instructors move from their traditional role of delivering knowledge to a role that focuses on empowering learners to generate knowledge.

Overview of Engaged Learning

The constructivist view of learning asserts that learners' construct their own meaning and knowledge from the information they acquire. This differs from the traditional view, which assumes a teacher can "deliver" knowledge to a learner (Dwyer, Ringstaff, & Stadholz, 1990).

In classrooms across our nation, students of all ages are discovering the benefits of an engaged learning approach to education, with the guidance of their teachers. The terminology frequently varies between locations, text books, and experts, but the concepts remain constant. *Engaged learning, constructivism, problem based learning,* and *discovery learning* all address the concept of student-focused learning within a teacher-facilitated environment. This approach yields knowledge acquisition that is focused on the evolving student needs and not on planned teacher-delivered lecture notes. To simplify discussion, the label *engaged learning* will be used as the term of choice throughout this paper.

Piaget (1969) defined engaged learning (constructivism was his term of choice) as how we come to know our world. Knowledge is built upon prior experiences and there must exist a connection to the learner in order to be meaningful. Piaget believed that the accuracy of a response was less important than the lines of reasoning and assumptions that learners followed to reach a conclusion. So he developed a theory of developmental stages of intelligence (Piaget, 1952; 1969). Piaget believed that learners constantly try to make sense of the world and in so doing, construct hypotheses and generate knowledge. He had great influence on teachers of young children.

It is important to realize that technology integration is a key component when discussing engaged learning. The history of education is filled with instances where students and teachers were focused on student-oriented learning, but today's pedagogical evolution has added technology to the equation. The chosen methodology for integrating technology into the classroom has been identified as "engaged learning" or constructivism (Wilson, 1996). The next evolutionary step of utilizing distance learning in an engaged learning setting has captured the excitement of many individuals in the field of education for both children and adults.

Engaged learning is an instructional term that encompasses not only the principles of constructivism but also includes the concept of a problem-based learning environment. For teachers, an engaged learning approach involves modeling, reflecting, actively involving the students, and developing a community of fellow learners in reality-based scenarios. Engaged learning is a collaborative learning process in which teachers and students are partners in constructing knowledge while answering essential questions. This strategic approach includes setting goals, establishing timelines, creating authentic products, and assessing the process as well as outcomes.

Why Is Engaged Learning Essential Within an Online Learning Environment?

Something almost "magical" happens when technology is combined with teaching in an atmosphere of engaged learning and discovery. Repeatedly, we have seen the resulting student empowerment when technological tools are added to the classroom experience. Many people believe that successful technology integration requires an engaged learning orientation (Dwyer et al., 1990; Strommen & Lincoln, 1993; White, 1995; Wilson, 1996).

The Internet has created a world where knowledge is dynamic. Information and resources are constantly changing, sometimes making textbooks obsolete prior to the first printing. In this environment of rapid technological change, a "stand-and-deliver" classroom approach will not meet the needs of our future citizens. While it is important to recognize that some information will remain stable, the volume of information and changing delivery options require astute care and attention. The society of tomorrow will be faced with a world overflowing with technological challenges and opportunities. Businesses are searching for individuals who can not only function comfortably in cyberspace but who also can work collaboratively with others in problem-based situations. An engaged learning approach offers the foundation for creating a population of "lifelong learners" and constructive problem solvers.

Whether we are discussing a classroom situation or a distance learning environment, the paradigm is shifting from an instructional model to a learning model with the benefits being garnered by each participant. With this shift it is becoming increasingly evident that online courses which simply replicate lecture-style classroom environments also replicate the distance learning mistakes of the past. Online courses which do not employ engaged learning techniques often become digital correspondence courses in which learners feel isolated or quit, thus perpetuating a high dropout rate.

Architects of Interaction in an Online Environment

One of the biggest questions in the minds of most online instructors is: "How do I engage the learners?" Contrary to popular belief, simply utilizing discussion questions that focus on the content is not enough. A framework is needed to surround those questions in order to maximize the processing which occurs in those discussions.

Engaging in Phases

An engaged learner develops over time. In most cases learners are used to a more passive student role and need guidance and the opportunity to become more engaged in a learning environment. Learners move through four phases of engagement as described in Table 1. Movement through each of the phases is facilitated by the "activity architect," the instructor. Not surprisingly, youthful students seem to adapt easier than adults to the engaged learning approach, most likely because we model what we have become accustomed to in life experiences.

Table 1. Phases of Engagement

Phase	Learner	Instructor	Weeks	Process
1	Newcomer	Coordinator	1-2	Instructor provides activities that are interactive and help the learners get to know one another. Expresses expectations for engagement in the course. Provides orientation to course and keeps learners on track. Examples: icebreakers, individual introductions, discussions concerning community issues such as Netiquette rules in the Virtual Lounge.
2	Interactive	Structural Engineer	3-4	Instructor forms dyads of learners and provides activities that require critical thinking, reflection and sharing of ideas. Examples: Peer reviews, activity critiques.
3	Collaborative	Facilitator	5-6	Instructor provides activities that require small groups to collaborate, problem solve, reflect upon experiences. Examples: content discussions, role plays, debates, jigsaws.
4	Initiator	Community Member / Challenger	7-16	Activities are learner-designed and/or learner-led. Group presentations and projects. Discussions begin to go not only where the instructor intends but also where the learner directs them to go. Examples: Group presentations and projects, learner-facilitated discussions.

Examples of Activities

Designing and utilizing activities that are appropriate for the various engagement phases of specific learners can promote confidence and success and may even move a learner through the phase more quickly. Here are two examples of phase-appropriate activities:

Phase 1 Example

Exercise Title: One Thing that Describes Me
Task: Introductory exercise at the beginning of a course
Objective: To introduce a student's interests and background to others in the class
Learner Instructions:

Look around and find an object or a digital image that represents you, or your reasons for taking this course, or even something about your research interests. Post a digital image of your chosen object: a scanned image, digital picture, or a web-linked image (for example) in the discussion board. Explain why you chose the item. Your explanation of the posted object should include a brief description of your expectations of the course and/or the perspective you contribute to the learning community. After you enter your description, comment on the descriptions posted by at least two of your peers.

Phase 3 Example

Exercise Title: Words
Task: Reflective exercise at end of course or a specific unit
Objective: Provide feedback to the instructor and other classmates on the shared experience

Learner Instructions: Take a few minutes to reflect upon your reactions to this week's class (or identified unit). What individual word or 2-3 word expressions come to mind? Enter each word or brief expression into the subject line of a discussion board thread. Post as many words or expressions as you can think of in a 5-minute period of time. This is not the time to analyze your input, just key and post. Wait 24-hours and review the responses of your peers. Choose one word or expression that "speaks" directly to you. Post a response to your peer and instructor explaining why this word has special meaning in defining the class experience to you.

Summary

Engaged learning does not simply happen. It requires "architectural engineering" by the instructor. Planning and utilizing activities that assist a learner in moving through the development phases of engaged learning ensures that learners are motivated and able to successfully interact, collaborate and eventually independently engage in an online learning environment.

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Biographical Sketches

Dr. Rita-Marie Conrad is an online faculty member at Florida State University. In this role she is responsible for managing the delivery of web-based courses on topics such as online collaboration, learning theories, and the design of web-based instruction. She also consults on the design and implementation of distance learning courses, manages technology-related projects, and provides educational technology consulting and training to K-12 teachers and higher education faculty. Rita recently co-authored the well-received *Faculty Guide to Moving Teaching and Learning to the Web* available at www.league.org.

E-mail: rconrad@mailer.fsu.edu
Phone/Fax: (850) 893-0895.

Dr. Ana Donaldson is an Assistant Professor at the University of Northern Iowa and an educational consultant providing workshops to instructors that provide guidelines and practical strategies for effectively using technology to apply the principles of engaged learning within today's classroom. Ana has also taught classes in Instructional Technology for Northern Illinois University and has been a contributing author and multimedia developer for the North Central Regional Education Laboratory. In addition to her years of classroom experience in creating web supported learning environments, she is a published author and international presenter.

E-mail: anadonaldson@home.com
Phone: (815) 654-3195; Fax: (815) 654-9338

Dr. Nancy Nelson Knupfer is an experienced professor of Educational Technology, classroom teacher at all levels of K-12 education, and adult educator for the military, corporate and government settings. She has served on the Board of Directors of several professional organizations and as President of the International Visual Literacy Association. Nancy has been a professor at both Arizona State University and Kansas State University. She currently is editor of the Journal of Visual Literacy, and is President of *Digital Horizons*, a company that employs technology for educational purposes.

E-mail: nknupfer@mail.h-net.msu.edu
Phone: (517) 351-6677
Fax: (517) 351-6642

19 Motivational Strategies for Use During Professional Development Workshops

Thomas E. Cyrs
President, Educational Development Associates
and
Professor Emeritus
New Mexico State University

Carol A. Cyrs
Vice President for Business
Educational Development Associates

Instructors do not motivate participants in a faculty development program. Instructors create an enthusiastic, positive and supportive environment that excites participants so much that they want to learn and choose to motivate themselves. The use of specific motivational strategies that introduce an element of fun reinforces this principle.

Too often professional development workshops are poorly organized, dull and boring. Lecture predominates. No one has any fun while they learn. The use of motivational strategies is either unknown to the instructor or simply not practiced. The 19 motivational strategies suggested in this paper have been very successfully used by the authors in many professional development workshops throughout the country. The suggested strategies represent only a sample of what can be done. The list is not exhaustive. The use of these strategies is based on the idea that workshop participants should have fun while learning. Having fun focuses attention on important key skills and provides a positive reference point.

The suggested motivational strategies are presented within the context of a learning module. This is a specific segment of instruction built around a concept and the accompanying learning objectives. A module contains a variety of learning components and runs from 15 minutes to several hours. It is a learning management tool designed to direct activities and provide participants with opportunities to apply their experience and prior training. A specific type of learning module, the IMPPACTS system, is introduced as a motivational strategy.

Nineteen Motivational Strategies

Provide the Learning Performance Objectives

Provide the participants with the cognitive and attitudinal learning performance objectives of the learning module. Explain why they need to master the information/skills, the benefits they will derive from mastering them, and how they can apply the skill immediately. Answers to these questions are difficult and require some reflection. Without justification of the program content, the benefits derived, and immediate application, participants do not have a context for their learning.

Negotiate Learning Contracts

Use learning contracts for longer workshops or short professional development courses. A learning contract is a formal written agreement between the participant and instructor that clearly states what learning performance objectives the participant will master. These objectives can be generated by the participant and negotiated with the instructor or they can be given to the participant by the instructor. The contract describes what the participant will learn, why they will learn it, how they will learn it, when the contract must be completed, where the student will learn the objectives, the criteria that will be used to judge whether the objectives have been competently mastered, and how the final assessment will be reported and to whom. This approach involves participants in the decision-making process of what they will learn.

Use Handouts or Study Guides

Use handouts or study guides. A study guide is simply a series of short handouts that cover several classes or a whole course/workshop. The use of study guides is no longer optional. Study guides are learning management tools that can be used prior to, during, and after a professional development program. They can be used to outline a short presentation with key concepts left out and filled in by the participants. They can also be used to generate activities with participant teams after a session. Quality study guides are seen by students as an indicator that the instructor has thoroughly planned the program.

Expose Yourself

Share your professional values, preferences, and biases and allow the participants to disagree. This can make for lively and heated discussion to explore alternative points of view. Explain why you hold certain values or preferences and the research that you have reviewed to develop your position.

Story Telling

Use stories to reinforce key points. Everyone loves a good story. It automatically commands attention and creates interest. Wrap your most important point around a story that contains personal experiences. The story must reinforce your point. Write the story out and practice it. The participants must immediately understand the point of the story and how it reinforces the point you are attempting to make.

Ask for Physical Involvement

Within the first few minutes of a workshop, ask for physical involvement. Repeat this before or after breaks, and before or after lunch. Request the participants to do something such as hold up a right or left hand, sit down, stand up, turn around, or wave a handkerchief in response to questions. This always generates laughter.

Ask a Question

Begin a learning module by asking a question that can/cannot be answered within the allocated time. The purpose of this strategy is to grab and focus attention on an issue.

Visualize an Analogy

When dealing with complex and abstract concepts, visualize an analogy. This technique is designed to focus attention on an unlikely object and search for similarities and differences. The visualization of the concept with an analogy is vital because both interactive television and the WWW are visual media. Visualization of an analogy can be accomplished with food, artifacts, clothing, or puppets.

Use Humor

Use humor to focus participant attention and make a point. This does not mean telling a joke. The humor should always be at your own expense. Make fun only of yourself, never another person.

Make a Provocative Statement

When the time is appropriate, make a provocative statement. This can have a quick emotional appeal and focus a group's energy on an issue. Use a newspaper, journal article, or video clip. Provocative statements can involve either overstatement or understatement. Ask the participants to accept or reject the statement at the end of the module.

Use Magic Illusion

A very effective attention-focusing strategy is magic illusion. It is fun and exciting if done correctly with a clear transition to the learning point. For example, the instructor brags that he/she has a photographic memory and can memorize the first four words in any book in10 seconds. A book is provided to the instructor and the words are memorized. A participant rolls a set of dice. The sum of the top and bottom of the dice are multiplied by five. Another participant turns to the page. The instructor gives the first four words correctly. After everyone calms down and asks how it was done, the instructor makes the point that if he/she can memorize this quickly, anyone can learn the magic of memorization. The instructor states that it is not the isolated words and facts that you know but rather what you can do with what you know that will make a difference. The emphasis in this program is application and critical thinking.

Cite an Unusual Statistic

Begin a learning module by citing an unusual statistic. Have a newspaper or an article in your hand and pretend to read the statistic. Then state that what is learned in this module will either prove or disprove the statistic. For example, "Research has demonstrated that 75%-85% of all tests given at the undergraduate level require nothing more than recall of factual data."

Create Curiosity

Create curiosity. Cover a large bag or box with a piece of black cloth. Look into the container and make a statement that suggests something inside represents the most important idea in the module. At the completion of the learning module, put the container away and never reveal what was inside.

Use Theatrics

Use theatrics to overstate a point or create an analogy. Wear or use a theatrical artifact to represent a key point and dramatize it. For example, the instructor could use a series of hats to represent the different hats that teachers wear or a set of tools to represent the tools of teaching.

Use Trigger Videos

Reinforce an important point or skill with trigger videos. These are three to five minute video clips edited from commercial videos or produced by the instructor. The videos contain a visual scenario that the participants must address. There is often an emotional appeal to the video.

Create a Dramatic Incident

Present a dramatic incident that is role played by participants or other instructors. After the incident, discuss the implications for the point you are trying to make in the module.

Involve Participants

Involve the workshop participants in their own learning as much as possible. This can be accomplished with a teaching/learning model called the IMPPACTS system. This acronym stands for:
I ntroduction: This consists of a few sentences that summarize exactly what the content of the module will be. The introduction acts as an advanced organizer and includes the learning performance objectives for the 30-60 minute module.
M otivation: Students are told why the content is important to master, the benefits they can derive from mastering it, and how the content/skill can be used in their personal and professional lives.
P ractice: The participants are involved in a short exercise/activity that immediately engages them in learning.This promotes team building skills, sharing and relating past experiences, and immediate involvement with the content.
P resentation: Based on the familiarity of the participants with the content of the module, the instructor conducts a short eight to twelve minute presentation. This is designed to clarify new concepts with examples and present new information. An Interactive Study guide generally accompanies the presentation to minimize note-copying.
A pplication: This segment demonstrates how the information or skill can be applied in the development of a program or course to be taught at a distance.
C ommunicate: Participants are encouraged to discuss the relevance of what they have just learned and explore how each member of the team could use the skill.
T ransfer: Using a segment of a course under development for distance learning, the participants transfer the information or skill to this course with feedback from the team and instructors.
S upplement: Additional information on the skill introduced in the module is provided on a CD or on additional handouts. This consists of the "nice-to-know" data.

If the participants have to deal with new and unfamiliar terminology in order to understand a key skill, create some team competition with crossword puzzles. Members of the first team to complete the puzzle receives a candy bar for each member.

Create Interesting Titles

As you develop each learning module create some interesting and pithy titles with a tag. This can create some curiosity. For example, a title for this segment could have been, "Motivators that Work: Turning Students on to Themselves." Another title used for a past workshop was, "Knowledge Dollars T: Consulting for Supplementary Income." Each of these motivational strategies is effective and fun. Use your own imagination and develop variations for the strategies. Who said that learning couldn't be fun?

Biographical Sketches

Thomas E. Cyrs is the founder and president of Educational Development Associates. He also holds the title of Professor Emeritus at New Mexico State University. Tom is a highly sought-after speaker and trainer in the fields of distance learning and college teaching. He is well known for his energetic, dynamic, dramatic, and thought-provoking presentations, use of examples and stories, visualization with puppets and magic illusion, and high levels of audience participation. For the past 30 years, Tom has conducted hundreds of distance learning and college teaching workshops and presentations nationally and internationally. Over 1,500 instructors and administrators have participated in these workshops and have come from more than 32 countries.

Address: 900 Conway Ave.
Las Cruces, N.M. 88005
E-mail: www.zianet.com/edacyrs/
Phone: (505) 523-9565

Carol A. Cyrs is the vice president for business with Educational Development Associates. Carol conducts international workshops in all aspects of distance learning with her husband, Tom. She holds a Bachelor of Arts in History and Master of Public Administration. Carol has taught high school English and Latin and is a certified tutor for dyslexic students. Carol has also been a coordinator for medical and allied health education and a marketing coordinator for a major hospital. Carol presents several of the workshop training modules and assists participants designing their own lesson and training modules.

Address: 900 Conway Ave.
Las Cruces, N.M. 88005
E-mail: www.zianet.com/edacyrs/
Phone: (505) 523-9565

Enhancing Videoconference Teaching Skills Through Innovative Faculty Development

Carol Daunt
Learning Technology Consultant
LearnTel Pty Ltd, Australia

Central Queensland University (CQU) is in Queensland, Australia, a large dispersed state with a population of 3.5 million. The university has 12,400 enrolled students, which includes 5,200 distance education students. For its distance students it has traditionally provided well designed printed notes - some of these materials are supplemented by audio and videotapes and audioconferencing.

Since 1992, videoconferencing has been progressively installed and used for teaching across all campuses of the university. A 1997 report into the use of videoconferencing found that, in the previous semester, it had been used for 104 hours of teaching across 4 campuses. The report found that training available to novice users was limited to technical and teaching issues that supported migration of lectures and tutorials and that resources were not available to support staff in any significant adaptation of their teaching to the new medium. Consequently, quality of teaching varied and relied mostly on the interest and enthusiasm of lecturers who invested much of their own time in adapting their teaching strategies and materials to the videoconference environment.

In 1998 a grant was secured to deliver customised training to lecturers and to put into place a process that would support them in converting their teaching style and materials to the videoconference environment. The intent of this project was to incorporate a comprehensive staff development process, driven by curriculum redesign, to develop more interactive, student centred teaching and learning environments using interactive videoconferencing.

Aims and Objectives

The main aims of this project were to:

- Support a practical hands-on approach to staff development that allowed staff to practice in a supportive environment encouraged by their peers.
- Improve the level and quality of interactive teaching and learning strategies, not only in videoconferencing but also in any teaching and learning environment.
- Raise student satisfaction with their classes through more active participation in the teaching and learning process.
- Encourage staff to develop self-reflective practices when planning, developing and maintaining their teaching and learning activities.

In order to achieve these aims, the project managers realised that it would be necessary to engage a private enterprise partner, with videoconferencing expertise, who would work with the university for the period of the grant – two years (1999 - 2000). Once this partner was identified, planning was undertaken to determine how best to provide professional development to the greatest number of staff and what key staff would be needed. A number of key staff were allocated to work part-time on this project.

Key Staff

The project involved a number of key staff:

- Project leader – overall responsibility for the project but little day-to-day involvement.
- Grant officer – overseeing of all aspects of the project from operational aspects to budget.
- On-site project manager (half-time position) – day-to-day operational responsibility of working with all involved in the project. On-site contact and support for lecturers.
- Project support officer – day-to-day operational support for all aspects of the project.

External consultant/private enterprise partner (located 1000 miles away) – on-going support and advice to management team, training workshops and individual support for lecturers.

Participants (mainly lecturers) – attendance at workshops, implementation of new strategies, redesign of courses in consultation with external consultant and on-site project manager.

Key staff interacted in the following ways:

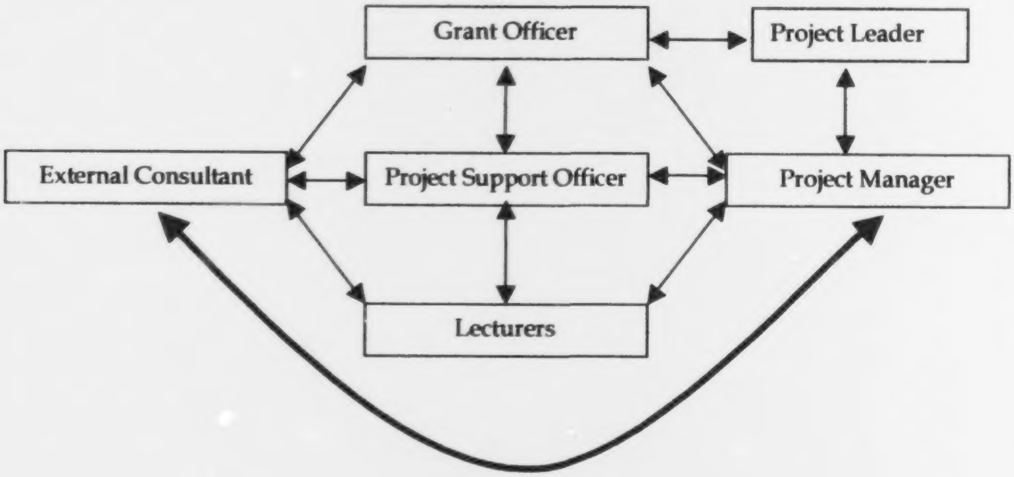

Figure 1.

Key Activities

The project involved staff in a series of activities that assisted in course redesign and enabled them to implement student-centred teaching and learning strategies in a supportive environment. This support included:

- Professional development workshops in the use of new technologies for open learning (introductory and advanced).
- Team based redesign of the teaching and learning strategies used in courses delivered via interactive videoconferencing.
- Advice and support to meet individual teaching needs.

challenges that arise in a changing teaching and learning environment.

- Peer support to meet the everyday concerns of teaching via interactive videoconferencing.
- General support and advice to key personnel such as Instructional Designers, Technical Designers and Senior Management.
- Staff based at the regional campuses able to attend workshops at no cost.
- Staff who worked on the redesign of their units allocated money to provide teaching relief.
- Major use of email as a communication mechanism between all participants - this included support for redesign activities from the external consultant.

Project Model

The model has evolved through three distinct phases with a fourth yet to be developed:

Phase 1

In the original planning, the model was to make it mandatory for all staff who used videoconferencing for teaching to attend a two-day workshop and to redesign all courses taught using the interactive videoconference facilities. It was soon realised that this was not practical and a new approach was formulated that would encourage, but not compel, lecturers to undertake this professional development.

Phase 2

After appointment of the project manger and engaging the services of the external consultant it was decided that there would be two types of workshops - a two-day introductory workshop and a one-day advanced workshop for more experienced users. Each of these workshops would be run twice a year for the life of the project. Attendance at these workshops was voluntary. In conjunction with the workshops staff could apply for small grants to assist them to redesign their course with assistance from the external consultant and the project manager.

These professional development workshops have been the major component of the project and have enabled lecturers to share expertise, reflect upon their own practice and develop skills in a supportive environment.

Phase 3

At the end of the first year, the external consultant and project manager decided to adjust this model by adding a third dimension – individual consultations. After each workshop the consultant would make herself available to meet one-on-one with individuals. In these sessions, lecturers could discuss their needs and ideas relating to videoconferencing. Some of these later went on to apply for redesign grants, but many just required some advice and guidance to help with their videoconference teaching.

Phase 4

The challenge for the fourth phase is to create a self-sufficient training model post 2000. At the time of writing, several options for this are being investigated and trialled to provide for both small group and individual training sessions for lecturers. Methods of capturing best practice in order to share this amongst practitioners are also being investigated.

Training Model

The training model adopted for 2000 utilised a combination of in-house and external expertise. It was designed to give lecturers initial competence in teaching via videoconference and provide support for them to enhance their skills. It consisted of both formal workshops and informal practice sessions to allow lecturers to trial new skills and techniques. The following illustrates the model adopted:

Implications and Recommendations

The reward systems within the university, for example promotions, place more emphasis on research than on teaching and learning. This makes it difficult to encourage staff allocate time to improving their teaching activities. Lecturers feel that they don't have the time to commit to attending a workshop plus reworking their teaching strategies for each course they teach using videoconferencing - even though after they complete this process it may decrease the time spent teaching and increase both their enjoyment and that of their students. Despite this barrier, over 100 staff have attended workshops, making it one of the most well attended staff development programmes that has been run at the university. Participant's evaluations of the workshops have been very positive.

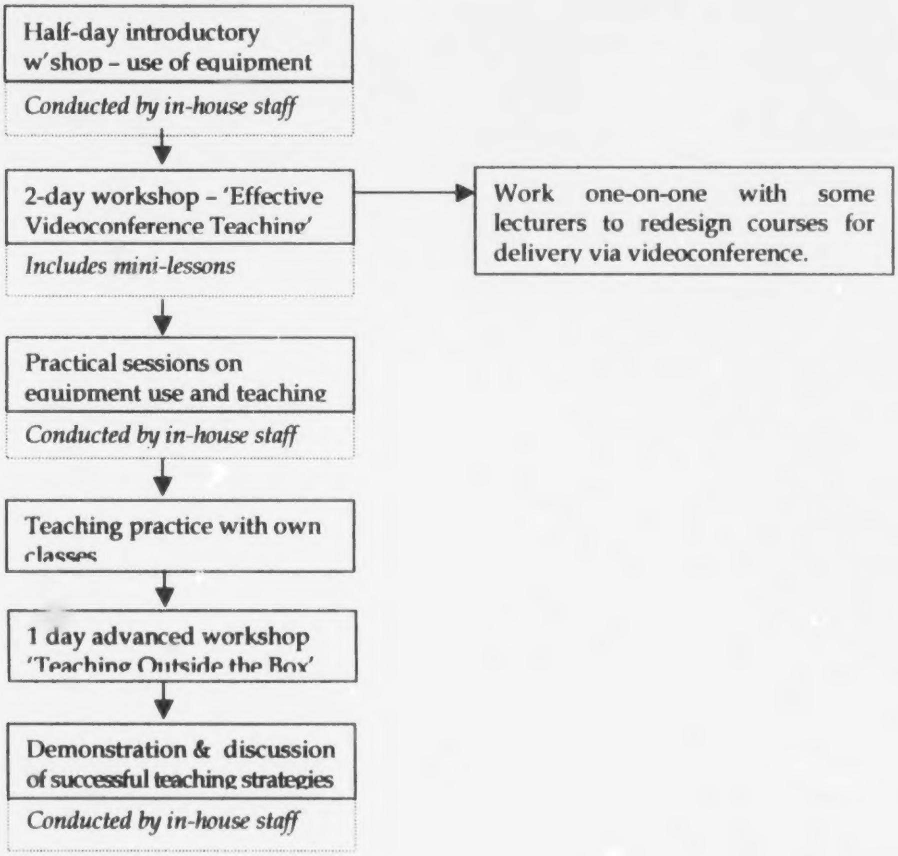
Half-day introductory w'shop – use of equipment
Conducted by in-house staff
2-day workshop – 'Effective Videoconference Teaching'
Includes mini-lessons
Work one-on-one with some lecturers to redesign courses for delivery via videoconference.
Practical sessions on equipment use and teaching
Conducted by in-house staff
Teaching practice with own classes
1 day advanced workshop 'Teaching Outside the Box'
Demonstration & discussion of successful teaching strategies
Conducted by in-house staff

Figure 2.

Lecturers have also responded well to the individual consultations and have appreciated the one-on-one assistance with their individual teaching needs. As is often the case, the opportunity to work with an external "expert" is perceived as being of great value – often of greater value than utilising internal expertise. However, being given the resources (mainly time) to enable them to reflect on and plan teaching strategies has been beneficial to lecturers involved in the redesign process.

The original aims of the project have been well met with many lecturers adopting new approaches to their videoconference teaching. They have been given the opportunity to reflect on their teaching strategies and many are striving for greater student participation through various levels of interaction in videoconference sessions. Initial student response has been positive. In the most recent semester, 110 hours of videoconferenced teaching were delivered each week.

One of the strengths of this project has been the on-going relationship with the private enterprise partner who has been available to work with the project managers and lecturers on an 'as needs' basis. Outside the workshops and on-site visits, lecturers have had access to the external consultant through email and telephone for on-going support and advice. Our recommendation would be to seek out a private enterprise partner who understands the needs and culture of your organisation and can be adaptive and responsive to your needs. Use of an external specialist involved full-time in their particular industry also ensures that a university has access to the latest information and practice available.

Biographical Sketch

Carol Daunt is a Learning Technology Consultant and Managing Director of LearnTel Pty Ltd. She is an experienced educator and videoconference trainer who has been involved with all forms of teleconferencing since 1986. Since 1992, Carol has been involved in the design, application and effective use of video-conferencing. She works with lecturers, teachers, trainers, health workers and management from many government departments and private organisations throughout Australia, New Zealand, USA and Europe. Carol holds a Dip T, Grad Dip Dist Ed, B Ed & M Ed (Research) – her thesis investigated the nature of interaction in videoconferencing.

Address: GPO Box 3137
Sydney, NSW 1043
AUSTRALIA
E-mail: cdaunt@learntel.com.au
URL: www.learntel.com.au

The Art & Science of Developing an Asynchronous Discussion Topic

Vanessa Dennen
Assistant Professor of Educational Technology
San Diego State University

In this day of moving classes online and serving students who are separated from the university by factors of time and space, many faculty have tried facilitating online discussions in classes that are taught wholly or partly using a Web-based conferencing system. Their attempts have been met with varying degrees of success. For the minority, their intuitive teaching style leads them to a successful experience — one that generates quality student participation without overwhelming the instructor. It is not uncommon, however, to hear the war stories of instructors who despite repeated attempts could not achieve as deep of a discussion as they do in a traditional classroom, or who spent an entire semester living and breathing at the computer in order to keep a discussion going.

Discussion activities in an asynchronous environment need to be clearly and carefully designed in order to achieve the desired amount and level of discussion. While we do not normally think of ourselves as designing discussion in a traditional classroom because we tend to do it 'in the moment' or unconsciously, successful online discussion cannot rely solely or even largely on ad hoc facilitation strategies to shape the activity. The online instructor needs to find ways to motivate students at the beginning of a discussion activity, in the hopes of avoiding problems like no participation, participation clustered in the last 24 hours of a discussion period, or participation that consists of posted messages that lack responsiveness or a sense of dialogue.

What is it that we can design in advance of our students participating? The focus here is on developing discussion prompts, topics, and guidelines in a way that provides adequate guidance for students from the start; allows each student to have a unique contribution; requires that students read each other's messages; promotes student-student discussion; and does not overwhelm the instructor during facilitation.

Background and Supporting Literature

To begin, it is useful to consider what it means to discuss. In a traditional classroom it tends to be a turn-taking activity, moderated or facilitated by an instructor, and following a particular theme. The discussion may follow tangents and will be shaped by some combination of the instructor's intent and the learners' contributions as they unfold in real time. We tend to not label or classify these discussions, unless there is a clear activity involved such as brainstorming. It is useful, however, to think about the purpose or desired outcomes of a discussion, particularly when moving into an online format. Online dialogue may take four different forms, depending on the discussants purposes (Jenlink & Carr, 1996; Sherry, Billig, & Tavalin, 2000): (1) Dialectic conversation is focused on logical arguments for uncovering truth; (2) discussion conversation occurs when different parties put forth their own perspectives; (3) dialogue conversation involves the building of intersubjective meaning through conversation; and (4) design conversation takes place when the focus of participants is building something. In an online course, discussion is the most common of these communication types, although dialogue and design conversation have clear applications in an online environment as well. Dialectic conversation is inquiry-based and less common, although still possible in an asynchronous discussion.

Various factors must be considered in the interest of generating actual dialogue and not just a collection of posts. Rogers (1998) points out that all discussion, asynchronous or otherwise, is linear; it only becomes non-linear through a participant's selective interaction. He recommends using a question and answer structure to promote discussion. This structure, however, is more likely to promote a series of individual dialogues between the instructor and students rather than a whole-class discussion. It is labor-intensive for the instructor and inhibits peer interaction.

Nonis, Bronack, and Heaton (2000) suggest that we might look at this issue in terms of four facilitative structures, environment, socialization, motivation and expectations. By environment, they mean that students should feel comfortable and able to participate; this is not just a technical issue, but also a matter of encouraging student buy-in to the course discussion through encouragement of sharing. Socially, they recommend that a moderator be used to respond to students — but not in a way that shuts down peer interaction — and facilitate the tone and issues of the discussion. In terms of motivation and expectations, students need to know exactly what they are supposed to do and why they are supposed to do it.

Instructors can use incremental deadlines (Dennen, 2000; Fisher, 2000) to help maintain or force conversation-like interactions. When students are given a deadline, typically they wait until the last minute to do an assignment. In an asynchronous medium, it is difficult to have a last-minute discussion unless all students are logged in at the same time and are emulating a synchronous interaction through the asynchronous medium. An assignment that requires students to enter the forum by multiple deadlines and post specific kinds of responses at each deadline can impose the kind of structure that is necessary to develop discussion-like interaction.

Discussion Prompts that Promote Dialogue

While facilitation strategies are undeniably a factor in promoting discussion, the discussion prompt is the initial direction for online students, who may choose to respond immediately or reflect on the topic and assignment for a while before contributing. Two key components of the discussion prompt are the issue (what will be discussed) and guidelines (how it should be discussed).

The issue in a traditional live class tends to focus on a lecture students have just heard or readings they have just completed. These same things can serve as discussion starters in an online course, only they need to be adequately developed and defined. A prompt to "discuss the readings" is too generic, and will generate a floundering response from students.

Even the most well-defined issue, however, can result in floundering participation as well. Students want to know what is expected of them in terms of quality, quantity and nature of their participation as well as in terms of topic. Students may be reticent to respond to a discussion prompt until others have set the model, unless the instructor has developed a clear model for them. Additionally some students will think one message is adequate participation while others will fret that their seven messages are not enough.

It is perhaps most fruitful to begin with an examination of overly vague discussion prompts and their likely results. A comparison between a traditional and an online class discussion highlights the increased importance of being well-prepared for online discussion:

> ***Sample Vague Prompt:*** "What did you think of the readings?" Or "What were the three main points of the author?"
>
> ***Traditional class:***
> Students might raise their hands to respond to the question. Only one student needs to respond in order to get the discussion going. It there are no hands raised, the instructor might revise the question, or wait until the room gets a bit uncomfortable and finally someone speaks. Such

actions might be based on student reactions within the classroom; the instructor can reframe the question, provide smaller, leading questions, suggest alternate routes into the discussion, and negotiate meaning with the students. To maintain the discussion, the instructor may then weave together student comments, ask more questions, and add his or her own perspective until the bell rings. It is the instructor's facilitation skills that determine the eventual success of this activity.

Online class:
It is likely that students would read this prompt and not respond until someone else goes first and sets the model. It might take a while — a number of days, really — before a student feels bold enough to answer. Whatever responses do come in may not fit the instructor's expectations, likely being too general. The instructor might then implore the student to say more; in order for the student to say more, he or she must return to the discussion looking for feedback. Unless the instructor carefully invites other students to participate and help expand the conversation, other students might take the instructor's response to be part of a discussion with that individual student.

In the case of the second vague prompt, once one student chimes in with the three main points, others may be less likely to participate assuming that the instructor's question has been answered. The instructor may facilitate by adding other questions or trying to channel the discussion in a particular direction, but there is no guarantee that the students will return to read these additions to the discussion. The initial prompt, thus, was the instructor's big chance to shape the way this activity unfolds.

As can be seen in these examples, specificity of expectations and room for multiple answers both are important factors in online discussion. A fact-based question has one right answer; once one students has given the correct response there is little incentive for others to participate, and if the instructor's goal is to see if students know the right answer, group discussion is not the best assessment method. Asking students to discuss the main points from certain readings is better, but still can reach a saturation point early in the pool of responses. To counter this saturation effect, students could each be asked to pick a unique topic or issue from the reading and share thoughts about it with the class, or they could be asked to provide a unique example or resource. It is still possible that duplicates would arise, but this type of prompt results in fewer duplicates.

Other activities that enable group sharing include sharing paper topics early in the writing process; debates; assigned role-plays, in which students must each take a unique, assigned angle on an issue; and jigsaw-type reading summaries, in which students all read, summarize, and share a different article with their discussion group. An instructor would want to use small (4 to 8 student) discussion groups in order to keep these activities manageable. In each case, the discussion prompt needs to specify that unique responses are expected.

Enabling students to have unique responses solves one problem, but can result in a series of posted messages read only by the teacher. In order to ensure that students read each other's contributions, such actions must be required. The best way to assess that students read each other's work is to ask them to respond to each other. This requirement should be built into the discussion prompt itself. An instructor might write the prompt as a series of steps to be followed:

1. Find a recent news story online that provides an example of one of the social issues in our recent readings. Post the URL and a brief summary of the article. Do not go into detail of what this is an example of or how it relates to the reading.
2. Select and read one of your classmate's contributions, and post a message under their thread that discusses what major social issue this article relates to and support your assertions with

references to our course readings. If there are secondary social issues, mention those as well. Please respond to a message that has not yet received a response so that we can make sure everyone gets at least one response. You may, of course, respond to multiple threads if you wish.

3. Read through the various threads that have been posted so far and ask topic and article-related questions within at least 2 of the threads.
4. Return to the places where you posted during steps 1 and 2 and answer any questions.
5. Return to your initial message and summarize what you have learned on the topic of your initial article.

Through these five steps, students are required to engage in posting with at least three other classmates, and it is likely that they will interact with five or more classmates during the course of the discussion. The discussion activity requires reading the course materials, and doing a little Internet-based research; successful completion of the discussion assignment requires critical thinking skills such as analysis and synthesis. Students who participate in this type of discussion will be engaging with the course material; they cannot complete the activity by just skimming the surface of an issue and they must be involved with at least four issue-based topics during the activity.

Not all discussion prompts created in this manner need to center around readings or require research. This same general framework of initial messages, developing someone else's initial message, questioning classmates, answering questions and then summarizing what was learned can be applied directly or in variation to any number of discussion situations.

One challenge that still remains with this type of discussion is timeliness and interdependence of students. Clearly no student can participate in this discussion alone, and that is the point. However, it is not fair that students who are conscientious and considerate of their classmates by posting early may have to wait to complete the assignment at the last minute because their classmates procrastinate or are not so well-organized. Incremental deadlines help in these situations; recognizing that a fair number of students are likely to complete their work in a deadline-driven manner, deadlines can be provided at each stage of the discussion. In the above example, there would be five separate deadlines for participation. Students eager to complete their work early would know when they could expect their peers to have completed the previous stage, thus reducing their frustration.

What is the right timing for deadlines? This really needs to be determined according to the overall class schedule in conjunction with the complexity of what students are being asked to do. A discussion period should match with other class activities. It does not make sense to extend a discussion on a topic past the date of the exam or related assignments. Thus, the overall discussion period can be used to help develop the scope of the discussion activity. Then within that scope, deadlines can be generated for the smaller discussion tasks. As a general rule of thumb, there should be enough time to allow students with busy schedules to reasonably participate, but not so much time that the discussion loses momentum. Typically, three to four days is adequate, unless a great deal of research is required.

Using the above example, I would recommend three days each for parts 1, 2 and 4, and perhaps only two days each for parts 3 and 5; the former parts require more thought and preparation than the latter ones. Also necessary to consider is weekdays versus weekends. It is not reasonable to expect that students will complete the assignment over a weekend; many students reserve that time for travel or families. When a weekend is part of the time frame, giving an extra day or two often is a good idea.

Additional guidelines may need to be provided in terms of the expected length and depth of the response. For undergraduates, the three-sentence rule provides a good minimum Once students say "I agree with you," and "That's a good idea," they generally are forced into adding at least one original thought of their own. If explicit references to readings are expected, that should be included in the guidelines as well. Providing model responses, even if they are responses to an altogether different topic, is a good idea as long as you do not think students will copy them too literally.

In closing, the combination of issues that allow for unique responses and clear, thorough guidelines within an online discussion prompt is a good way to promote learning dialogue in an online class. There is no one formula for writing discussion prompts; they must be crafted in a context-specific manner. Instructors who spend the time and effort to consider these factors when designing the discussion will reap the rewards of students who know what to discuss and how to discuss it.

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Biographical Sketch

Dr. Vanessa Paz Dennen is an assistant professor of Educational Technology at San Diego State University. She teaches both traditional and distance education courses, with extensive use of Web-based conferencing in both formats. She has been researching online instruction and teaching online since 1997, and works with other faculty in designing learning activities and promoting online collaboration among learners in their Web-based courses. Her research interests include computer-mediated communication patterns, and the design of Web-based learning environments.

Address: Dept. of Educational Technology, San Diego State University
5500 Campanile Dr, MC 1182
San Diego, CA 92182
E-Mail: vdennen@mail.sdsu.edu
URL: http://edweb.sdsu.edu/people/vdennen
Phone: (619) 594-1861

Distance Education Library Services:
An Opportunity for Personalized Customer Services

Mollie M. Dinwiddie
Professor of Library Services
Central Missouri State University

Linda L. Lillard
Assistant Professor of Library Science and Information Services
Central Missouri State University

Every day a growing number of universities are restructuring courses to offer via distance education. Though universities have been in the business of providing distance education since the late 1800's via correspondence courses involving text-based course materials and instructor-student communication by postal mail, technology is rapidly changing the methods by which these courses can be offered (University of Texas). Courses offerings are made available to distance learners by such methods as video conferencing, instructional television or other methods (Palloff & Pratt, 1999). Between 1994-95 and 1997-98, most of the growth was in courses that use asynchronous computer-based technology (primarily the Internet) rather than two-way or one-way video. What all distance courses have in common, however, is the fact that the student may not have physical access to campus and consequently does not have access to certain amenities such as library services.

Librarians are facing the problem of finding creative ways to meet guidelines set forth by the Association of College and Research Libraries (ACRL) that support the premise that the distance learning community is entitled to services that are equivalent to those provided to their campus-based constituents. Realizing that traditional methods of providing research assistance to students must be altered to fit the online course environment, librarians are utilizing various methods of meeting what they perceive as the needs of these online students such as e-mail and technology enhanced reference (University of Minnesota, 1998), a toll-free line (Blair, 2000), a distance learning library services web page (Buckstead, 2000), document delivery (Calvert, 2000), improved remote access to electronic resources (University of Minnesota, 1998); online tutorials (University of Minnesota, 1998); and electronic reserve (Calvert, 2000).

Background of the Study

At Central Missouri State University, librarians are attempting to help students meet information needs in an online course environment by not only providing them with access to full-text databases, document delivery, and state-wide library cards, but by actively engaging a librarian to assist with course instruction. This practice is consistent with the idea of more personalized service and becomes the kind of proactive role that is promoted for librarians by contemporary library schools (Grover & Hale, 1988) for librarians moving into the 21st century information environment with all of its new and exciting roles (Medhurst, 1995). Caspers (1999) states that librarians must be proactive in their efforts to make the library visible and accessible to distance learners because they can't simply look at the campus map and go there as the traditional students are able to do. She asserts that "it is crucial for the distance education librarian to actively become part of the distance education community, especially as related to programs emanating from the home campus" (pp. 301-302).

What kind of library services and research assistance do distance learners really want from a librarian? Kuhlthau's (1993) 1983 study of high school students revealed that they did not believe that librarians contributed to their accomplishment of information seeking tasks. In fact, only 3 of 25 students responded that they "almost always" or "often" needed the librarian's assistance during their research. In a verification study conducted in 1990 that included 385 people making up three different types of users, Kuhlthau, Turock, George, and Belvin still found limited use of the librarian's expertise during the research process. The users in Kuhlthau's studies, however, were not distance learners. Do distance students feel differently about the librarian? Is librarian mediation throughout their entire research process something that distance learners will embrace enthusiastically?

Believing that "in order to have a successful library program for off-campus students, librarians must understand who their students are and what they want," librarians at the University of Iowa conducted an off-campus user survey (Dow, 2000, p. 119). What they considered to be the most useful information obtained from the survey was the ranking students gave to a list of twelve different library services. At the top of the list were web and/or e-mail reference services, electronic services such as remote access to full-text databases and online catalogs, and document delivery services while at the bottom of the list were user education services. The results of this survey could lead us to believe that these distance students think, as did Kuhlthau's users, that the librarian is of limited use to them in the research process. Another question then becomes evident. Do students actually know what kinds of assistance they can ask of a librarian? Kuhlthau (1993) believed that "students lacked constructs that would prompt them to request mediation from a librarian in even the more traditional tasks of topic selection and information collection. They regarded the library as based on self-service access with little provision for professional/client interaction" (p. 129).

A librarian in the role of co-instructor in an online course is a new approach to providing library services for distance learners. Not only does this approach make mediation into the research process a possibility; it also allows for mediation into the entire student learning experience. In the face-to-face learning environment, one would never expect to find a librarian in the classroom with the content instructor during every class meeting. Will the students take advantage of this new role for the librarian in such close proximity and request more mediation into their research process? In order to develop a library service model for distance students, a qualitative examination of the experience of students taking an online course with a librarian in the key role of a co-instructor was conducted. In the initial experiment there were two nursing classes, one undergraduate and one graduate level course. Upon completion of two semesters with these courses, the data collected in a survey of the students and through the email messages to the librarian instructor provided evidence that students found the services of a librarian in an online course to be useful. However, there was some reluctance to ask the librarian questions, despite the plethora of messages from the librarian offering assistance. There appeared to be an increased volume of communication with the librarian by students in general – not only those enrolled in the online course.

Results of the Study

In a follow-up experiment during the fall and spring semesters of 2000-01, additional courses were brought on board with the librarian entered as a co-instructor. During the spring semester 2001, there were 9 courses that included five criminal justice criminal justice courses and four nursing courses. Three of the courses, one criminal justice and two nursing, were graduate courses. At least one message was sent via email to each student enrolled in the 9 different courses advising them of the Library Resources information and the assistance of the librarians that was readily available. Out of approximately 170 students in all classes, 46 students responded to a request for input regarding the services of a librarian in an online course. Their responses were overwhelmingly positive about the idea, but of even greater interest were the additional comments posted on the topic. There were comments regarding the demand upon the librarian's time and a suggestion that she be paid extra for the assistance in the online course! It was gratifying to find comments that indicated an appreciation for the search skills of the librarian!

In order to determine how the student viewed the possibility for a personalized or customized service from a librarian in the online course, four statements dealing with service of the librarian were posed within a questionnaire of 15 total statements. Using a Likert scale of responses that included Strongly Agree, Agree somewhat, Disagree Somewhat, Strongly Disagree, and No Opinion, the percentages of responses were tabulated.

Statement 6: Questions I directed to the librarian working with this course were answered in a timely manner, resulted in the least positive response. Out of 114 total responses, 8% either Disagreed Somewhat or Strongly Disagreed or approximately 9 students. While this is a small number, it was a disturbing figure because the librarian believed she had replied to almost all queries within about 48 hours. Apparently, a concern that developed during the earlier experiment proved to be true. With the increased number of courses that involved the same librarian, there was a corresponding decrease in the amount of time that could be devoted to each course. It is possible that the increased demands overall resulted in a lower satisfaction level regarding timeliness of response.

Statement 10 assessed the students' willingness to ask for help: I felt comfortable asking for assistance from the librarian working with this course. In that question, 46% Strongly Agreed and 23% Agreed Somewhat. The No Opinion responses were 27%. Those responding No Opinion may NOT have believed they needed the assistance of the librarian at all. Nevertheless, 69% answered with a positive response regarding their comfort level in asking for help.

Statement 13 requested the students to respond to the following: My expectations regarding the assistance provided by the librarian were met. Strongly Agreeing were 44%, Agreeing Somewhat were 24% and the No Opinion responses totaled 24%. None Strongly Disagreed and 8% Disagreed Somewhat. In a future study an effort will be made to determine what are the expectations that the students have regarding the librarian's involvement in the course.

Statement 14 posed this: Because of her involvement with this course, I will ask for assistance form the CourseInfo librarian for future research needs while I am continuing my degree program at Central. Responses indicated 53% Strongly Agreed, 29% Agreed Somewhat, 16% offered No Opinion, leaving only 2% to Disagree Somewhat or Strongly Disagree. One might have anticipated that the 8% who believed the librarian did not respond in a timely manner would also have tended not to ask for assistance in future courses. Nonetheless, the indication is that students did have an appreciation for the potential help that a librarian might render and were likely to take advantage of that opportunity for customized or personalized service in the future.

Conclusions and Recommendations

Using the comments to open-ended questions, the results of the Likert scale survey, and the discussion board interaction with the students, several conclusions can be drawn. The opportunity for customized or individualized service to library clients in an online course is believed by students in online courses to be a desirable option. A significant portion of students in the online courses in the experiment indicated a positive view of the value of having a librarian available in the online course with comments they made to a discussion board. In the discussion board opportunity 46 out of 114 student commented and 100% of those comments were positive ones about the need for this service.

The biggest drawback to providing high quality service in this model is that the librarian might be overwhelmed with requests for aid and falter on the timely delivery of assistance. A recommendation for alleviating the timeliness issue in the model is to develop pseudo courses in the online course software in which all students in a field of study are systematically enrolled at a selected point in their matriculation. This would be a generic "course" with tutorial information posted, links to appropriate web sites, and other "help" information to guide the student in a self-assisted learning experience. The direct involvement of a librarian in a specific course would be limited to a small number of selected high research oriented courses in the discipline. Ideally, the librarian would be minimally involved on a daily basis with the "pseudo" online course, but the opportunity for assistance would be there for those who experience difficulty in their use of the tutorial information for self-instruction. The librarian would have a significantly more active role in assistance to students in selecting resources, narrowing a topic, effective searching, and evaluation of search results in those online courses that have a significant research component.

The online instruction environment is ripe with opportunity for librarians to demonstrate their crucially needed research instruction skills. Some students grasp the need for assistance from an information specialist. With this kind of direct involvement with students who will know the librarian personally, albeit remotely, the passive model for offering research assistance will evolve into an active model. The librarian becomes an integral part of the student's learning rather than a peripheral. David Majka (2001) recently commented that there is a common misperception about the value of electronic information resources to the degree that library clients are tending toward a belief that they have no need for librarian assistance. Librarians have contributed to this belief as we actively encourage students to use online and other electronic resources instead of traditional ones. This trend may be exacerbated among distance learners. The model which includes the direct, proactive involvement of a librarian within distance learning courses, offers an opportunity to market the value of the librarian as "primary intermediaries for information retrieval" (Majka, 2001, p. 61), a critically needed activity according to Majka. The subtitle for his article, *Solid Research and Good Scholarship vs. Surfdumb and Inforamus* identifies the problem. The customized service of a librarian in online courses is one method that may help to counter this issue.

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Biographical Sketches

Mollie Dinwiddie is Professor of Library Services and Director of Technical Services at Central Missouri State University. She serves as library liaison to the Departments of Nursing and Criminal Justice and is an adjunct professor in the Department of Library Science and Information Services. Her M.L.S. is from Peabody College of Vanderbilt University and she holds an Ed. Spec. in Learning Resources from Central Missouri State University.

Address: James C. Kirkpatrick Library
Central Missouri State University
Warrensburg, MO 64093
E-mail: mollie@libserv.cmsu.edu
URL: http://library.cmsu.edu/mollie/mollie.htm
Phone: (660) 543-8780
Fax: (660) 543-4071

Linda L. Lillard is Assistant Professor of Library Science and Information Services and serves as chair of the department. She has a research interest in distance learning and in information seeking of online entrepreneurs. She holds an M.A. from San Diego State University, an M.L.S. from Emporia State University, and is A.B.D. in Library and Information Management at Emporia.

Address: James C. Kirkpatrick Library
Central Missouri State University
Warrensburg, MO 64093
E-mail: lillard@libserv.cmsu.edu
URL: http://library.cmsu.edu/instruct/linda.htm
Phone: (660) 543-4149
Fax: (660) 543-8001

Lessons Learned: Tales From the Trenches

Rose A. Doherty
Assistant Dean
Northeastern University

Todd J. Leach
Associate Dean
Northeastern University

There is an IBM ad in which an executive learns that the Web site is down and one vendor is blaming another. When the executive finally asks who is ultimately responsible for making sure it all works, she is shocked to learn that she is the one who is charged with making sure it all works. A serious Web-based distance education effort can rely on numerous vendors, instructional designers, Web developers, and faculty, but it is the administrators that need to make sure these pieces fit and work together as a whole. Regardless of whether or not you understand Java code or can build databases with Cold Fusion, there is a lot you can do to insure your online initiatives are successful. Our experience with Northeastern University Online may provide just the lessons you need to avoid being lost in the trenches.

Before launching Northeastern University Online (NUOL) we spent several months making plans, setting goals, and discussing options. As it turned out, this was the foundation of our success. Many distance education efforts fail because they have been built in a haphazard fashion. Several enthusiastic faculty members get approval to put their courses on the Web using a variety of courseware packages and technology. The end result is an online presence that is inconsistent at best and potentially turns away students permanently, in spite of the hard work of faculty. Students expect more than an online experiment; they expect an experience that is representative of your university's reputation, they will not give you a second chance. For Northeastern, it was important that NUOL reflect the mission of the college and represent some of our strengths.

The plan became the basis for gaining support from the central administration. Given our budget model, we needed to include incremental revenues among our goals. In fact, we began producing a contribution in year one that has substantially grown every year since. Unfortunately, this was the only way for our unit to obtain the funds necessary to support and market a decent initiative. But revenue goals alone are dangerous to a fledgling distance education effort. We tied our mission to the University's goal of access and "practice oriented" education. We also tied our objectives in with an existing satellite-based distance education effort and stressed the importance of getting beyond the initial learning curve.

We knew the only way for us to be successful was to have a product that could stand out in the market place. This meant a focus on some of our more innovative Web and Technical Writing programs that had already proven to be very marketable on ground. The question as to how a new entrant to online can differentiate their basic English writing course from everyone else's comes up often, but the reality is even more complex. Companies are beginning to turn to small modules called "learning objects" as a way to better focus their education dollars. Rather than reimburse for an entire writing course, these companies may want a module just on sentence punctuation! What you end up with is fairly generic offerings that must compete on price. We are avoiding this dilemma by focusing on our curriculum strengths.

There are a few institutions developing courseware and hosting everything on the university servers. At the other extreme, there are turnkey course providers that simply want to brand their offerings with your name or that would like you to become a reseller. At Northeastern, we decided to maintain control over all aspects of the content. This meant using our own curriculum, faculty, and Web developers. This is what we were experienced in. What we were not equipped to do was develop our own courseware or support the technology 7 X 24. We ultimately outsourced the technology end. However, choosing the correct vendors can also make or break your success.

In this day of dot-gones, it is important to evaluate the financial health of the vendors you choose. You won't get 7 X 24 support if your vendors are no longer in business. In addition, we sent Northeastern representatives to our vendor's corporate headquarters to examine their fail-safe server system ourselves. In the end, it will be the contract that drives your relationship with the vendors. Do not assume that what you have been shown is what you are buying. Many vendors have several levels of product offerings and may show their best. If you expect to be getting something as part of the deal, make sure it is spelled out in the contract, and be sure to include an exit clause as part of the agreement. In all likelihood, you will be referring back to the agreement on occasion.

Once the issues of how the coursework will be delivered have been decided, the next step is to consider the curriculum, the faculty, and the students. Even after one achieves a certain measure of success, plans must be in place to expand the curriculum and grow revenues without diluting the offerings or confusing the public. Northeastern University has developed courses that fit a certain student profile. If the program is to grow, new coursework must be developed for that profile, and new areas must be developed.

When choosing curriculum, several factors are important. Getting the right mix of courses is the result of scanning the marketplace to make sure that the offerings are the hottest items. Devising certificates, made up of a group of related courses, gives an institution the opportunity to make more of marketing dollars because a student will come for more than one course. Beginning a venture with courses that have a technology focus provides the opportunity to have both faculty and students with some computer expertise. Northeastern University began with a small number of credit and noncredit certificates and has been adding programs each year. This fall a Bachelor of Science degree completion program in technical communications will be available on line. The curriculum, however, must not remain static. New trends must be observed. Administrators must constantly scan the marketplace to assess the needs of the public and the competition, not just local institutions but schools and companies worldwide.

In order to make the on-line program run smoothly, a policy and procedures manual for the administration, a faculty handbook, and a student handbook must be developed. An on-line learning aptitude survey for students, an on-line demonstration course, and an easy-to-follow student orientation will help student retention. All contractual, copyright, and intellectual property issues must be resolved before launching the program. Vendor and institutional obligations for training must be spelled out clearly.

While the latest research in the area of distance learning must be followed, surveying the institution's students and faculty will help to determine the success. In our survey of on-line faculty at Northeastern and other institutions, instructors rated the following student qualities as very important; they must be disciplined, self-directed, highly motivated, and they must be able to write well because all communication takes place in writing. The on-line faculty felt that the most important factors for instructor success are content knowledge, classroom teaching experience, patience, flexibility, and writing ability. We would faculty with experience at your institution and with clear knowledge of your mission and culture helps to make distance learning more successful. Faculty must provide prompt feedback; students note that the ongoing dialogue with faculty and peers makes a program successful. Faculty must also give very clear instructions to students and make sure that the learning objectives for the on-line courses match the learning objectives for classroom offerings.

Institutionalizing distance learning is a challenge faced by all institutions. To institutionalize on-line classes, every part of the institution—faculty, registrar, bursar, admissions--must agree on the nature and importance of on-line learning. Distance learning must be an integral part of the larger institution, not a quick and trendy way to generate revenue. The distance-learning administrator must be willing to work hard to achieve institutionalization. Institutionalization is a reality when the organization and all its stakeholders, internal and external, see distance education as a legitimate and worthwhile part of the institution's mission.

Developing an effective on-line presence can in many ways be equated to a new business start-up, and administrators must plan for the growing pains of a new business. A few issues to consider are ongoing training, effective marketing, legal counsel, continuous site maintenance, reachable help services, further curriculum development, and improvement of faculty rewards. The distance-learning administrator must share qualities with the entrepreneur in a new business and must be creative, flexible, and willing to take risks. What was considered cutting edge when we launched our first program is passe, and what was once acceptable to students no longer lives up to their expectations. We must not be surprised as the IBM executive was. We must benefit from the experience of the past and build a distance learning initiative that will last.

Biographical Sketches

Rose Doherty is the Assistant Dean and Director of University College Liberal Arts and Criminal Justice Programs at Northeastern University. She was part of the original Online Planning Committee at Northeastern and has presented on the subject of distance education at numerous conferences.

Address: 265 Ryder Hall
Northeastern University
Boston MA 02115
E-mail: r.doherty@neu.edu
Phone: (617) 373-2416
Fax: (617) 373.2325

Todd Leach is an Associate Dean of University College at Northeastern University, and oversees Business and Information Technology programs, including one of the first E-Commerce degrees in the country. He has presented on the subject of distance education at several conferences and has published on the subject of Web Development.

Address: 270 Ryder Hall
Northeastern University
Boston MA 02115
E-mail: t.leach @neu.edu
Phone: (617) 373.2418
Fax: (617) 373.2325

College Composition Comes to High School:
A Distance Learning Report

Dr. William Dynes
Associate Professor, English Department
University of Indianapolis

Mrs. Elizabeth Kiggins
Assistant Professor and Director of Center for Instructional Technologies
University of Indianapolis

Mrs. Dawn Colavita
Director
Interactive Distance Education Access to Learning

Developing technologies are offering a variety of new options for instructional delivery, and many teachers and administrators are feeling pressure to increase distance learning offerings. Too often, the result of that pressure includes substantial hardware investment with little faculty endorsement, "enhanced" classes that are merely traditional courses squeezed into new formats, or confused and possibly conflicting goals. No single set of "best practices" exists for the variety of distance learning and technologically enhanced classrooms, and so an ongoing dialogue among practitioners is crucial to the process of developing and improving the effective integration of technology and teaching.

The University of Indianapolis is developing dual credit courses enrolling university undergraduates and high school students. Students participate through a two-way video conferencing system and the Internet. High school students receive both high school and college credit for their work, and all of those involved enjoy the benefit of a broader range of voices, ideas, and insights than would be possible in a traditional face to face classroom.

History and Preparation

Dawn Colavita, director of Interactive Distance Education Access to Learning, having had daughters experience the benefits of dual-credit course in a Florida high school, had a passion for extending this opportunity to high school students in the I.D.E.A.L. Consortium. So many students breeze through their senior year of high school. Then, as college freshmen, they are overwhelmed with the combination of college life and 4-5 difficult courses. Many either don't make it through this process or their grades suffer to a point that makes it difficult to climb out of a low GPA hole. Taking one or two college courses at a time, in a high school setting with high school support, allows students to experience the differences in difficulty and design of these courses in a low risk setting. Colavita approached the University of Indianapolis with the proposal that the University of Indianapolis offer a section of its basic Freshman Composition course to students in west, central Indiana via distance learning. This proposal coincided with the University's desire to reach out to a wider variety of potential students.

In the Winter 2000 Semester, Bill Dynes of the English Department offered English 101 DL, connecting University of Indianapolis students with students at Southmont High School in Crawfordsville. Based on the experiences of this class, Dynes was able to offer an expanded class, now linking three high schools with the University, in the Fall of 2000, and is currently teaching Freshman Literature, English 102DL, in the same configuration.

Beth Kiggins, director of the University of Indianapolis' Center for Instructional Technologies, coordinated the distance learning technology. The university is a member of the Vision Athena distance learning network that is coordinated by the Corporation for Educational Communications (CEC). The CEC was formed as part of Ameritech's Opportunity Indiana plan. For more information on the CEC, please reference the following URL: http://www.visionathena.k12.in.us/va/home.htm. The university's distance learning classroom consists of the following equipment: two video cameras (student tracking and instructor tracking), document camera, 53" monitor, 27" monitor, VCR, built-in microphones, echo canceller, wireless remote control, touch pad control, wall mounted speakers, and an instructor workstation. While this session will focus on dual-credit courses taught by Dynes, the university has also taught Management and Introduction to Marketing classes in the interactive environment. Next fall, the university will be teaching an introductory German class in the dual-credit format.

The class also used a Blackboard CourseInfo site to facilitate connectivity and interaction. Students had access to class notes, instructor announcements, links to related sites, and other online resources, and used the site for both synchronous and asynchronous discussions, e-mail, and essay and exam submissions. The combination of real-time video conferencing and asynchronous internet access was crucial to the success of the class as a whole.

Implementation

High school students applied specifically for ENGLISH 101 DL, and were enrolled on the basis of their performance on competency exams identical to those taken by incoming students. University students, on the other hand, were not told that they were being enrolled in a distance learning course. This approach had the very positive result of uniting motivated high school students with university students with whom they could interact comfortably and effectively.

English 101 DL was necessarily an adaptation of the English Department's usual Freshman Composition offering, so there were no substantive changes in the pedagogical goals of the course. There were, of course, a few changes to the practical, day-to-day elements of the course, but for the part minor in nature. These changes included such things as a more flexible due date and return policy for student work, a greater reliance on asynchronous contact, and a slightly greater reliance on objective quizzes that students could take online.

Following the success of this class, we offered English 102DL, a literature survey and composition course. The overall format of this class was largely similar to that of the composition course, but the differences between teaching composition and literature encouraged some fresh experiments with organization and group work.

Conclusions

The outcomes of these classes have been very positive. The most important lessons have been the virtues of patience and creativity. Many casual interactions simply take longer when those involved are separated by a video monitor; it is easier for students to get distracted, and harder for an instructor to maintain control. Technical surprises cropped up occasionally. A class with an extremely rigid timetable would have a hard time adapting to the constraints imposed by this delivery system.

The chief practical difficulties that arose during the course of the semester weren't necessarily those we expected. There was actually very little friction among students. Similarly, the remote students did not seem terribly concerned about lack of contact with the instructor. There has been some concern about the emotional connections among students and between the students and the instructor; we are experimenting with new ways of implementing group activities that encourage interactivity among the various constituencies of the course as a solution to this problem. Overall, however, student evaluations and reactions have been very positive; university students found themselves mentoring and encouraging "near-peers," and high school students appreciated the opportunity to gain college credit and college experience. One student who took the first semester of this course, later wrote, "Personally, what helped me out a great deal in coming to college was the distance learning class I took through the University of Indianapolis." Perhaps the clearest sign of the class' success is that we currently have a dozen applications from students from these same high schools for distance learning classes this fall.

This presentation will be extremely valuable to both high schools and universities that are either currently involved in or are considering developing distance learning partnerships. The opportunity for specific experiences and a dialogue about successes and difficulties will help both the presenters and members of the audience improve the delivery of effective, meaningful education in new ways.

Biographical Sketches

William Dynes is an Associate Professor of English at the University of Indianapolis.

Address: University of Indianapolis
1400 E. Hanna Ave.
Indianapolis, IN 46227
E-mail: dynes@uindy.edu
URL: <english.uindy.edu>
Phone: (317) 788-3512
Fax: (317) 788-3300

Elizabeth Kiggins is an Assistant Professor and Director of the Center for Instructional Technologies at the University of Indianapolis.

Address: University of Indianapolis
1400 E. Hanna Ave.
Indianapolis, IN 46227
E-mail: kiggins@uindy.edu
URL: <ctl.uindy.edu>
Phone: (317) 788-6154
Fax: (317) 788-3275

Dawn Colavita is Director of I.D.E.A.L., Interactive Distance Education Access to Learning

Address: One Athenian Dr., Crawfordsville, IN 47933
E-mail: dcolavita@cville.k12.in.us
URL: <www.visionathena.k12.in.us>
Phone: (765) 364-3246
Fax: (765) 354-3200

Behind the Scenes of an Online Degree Program: Effectively Serving Students

Patricia J. Fellows
Director of Distance Education
University of Wisconsin Colleges

Kris McGrew
Director of Learner Services
and the Higher Education Location Program (HELP)
University of Wisconsin Learning Innovations

Establishing an online degree program is a challenge to any institution. For the University of Wisconsin Colleges (UWC), the 13 freshman-sophomore campuses of the University of Wisconsin System, the challenge was even greater because our campuses and administrative offices are so geographically dispersed across the state. However careful planning, communication, teamwork, and collaboration with University of Wisconsin Learning Innovations (UWLI) has led to the successful launching of the University of Wisconsin Colleges Online Program. In 1998 the University of Wisconsin Board of Regents created University of Wisconsin Learning Innovations, a utility, whose primary purpose is to work with other UW institutions in the development of online learning programs. UWLI works with University of Wisconsin Colleges faculty to develop courses, as well as provide the infrastructure necessary for the UW Colleges to offer an online degree. Instructional designers, server management and course hosting services, student services and e-commerce are a few of the key areas where UWLI takes the lead. The UW Colleges provides faculty, curricular planning, pedagogical expertise, and overall coordination of the collaboration.

Several lessons have been learned about coordinating student services, registration, fee payment, textbooks, and the technological infrastructures when multiple institutions and distant students are involved. June 15, 2001 the UW Colleges accepted their first degree seeking student in their new Online Associate of Arts and Science Degree Program. Several collaborations with institutions across the country will provide the opportunities for these students to continue work online, toward their bachelors and masters degrees.

UWC & UWLI Program Histories

One of the main purposes behind the creation of UW Learning Innovations (UWLI) by the UW System Board of Regents in 1997 was to provide a high quality, coordinated delivery mechanism to offer UW educational content via the Internet to a national and international audience. UWLI provides services in marketing and enrollment sales, course development and instructional design in various platforms, faculty training, and learner support services.

Another goal of UWLI was to provide a platform on which campuses could collaborate, deliver programs jointly or as a consortium, and use their resources effectively. In many cases, UWLI works cooperatively with multiple campuses to coordinate the delivery of a single degree program. For some programs, up to five institutions have decided to collaborate on the creation and delivery of a degree. Often faculty will join forces across campuses to create and deliver the curriculum. For undergraduate degree programs, the UW Colleges Associate Degree is an integral component of those degrees.

This necessitated the creation of a registration and tuition payment function that would allow learners to register for courses from multiple institutions in one process—one payment, one refund and withdrawal process and one office to handle the front end administrative processes. UWLI handles these processes and shares learner data and revenue with campuses on the back end.

UWLI loads learner data from the LRMS into each course and sends learners information about how to access their courses—including the URL and username/password. Some learners are on-campus and just happen to be taking a course online. Since the whole philosophy behind the LRMS is to provide students with an easy process, these students register for the online courses as part of their regular on-campus registration process. This means that the UW Colleges also transfer data from the campuses to UWLI in order to have a complete listing of all students in a course.

To this UWLI has added the capability for multiple campuses to collaborate and use their resources effectively by allowing students to register for courses from multiple institutions in one process. One payment, one refund and withdrawal process and one office to handle the front-end administrative processes. UWLI handles the complexities and shares student data and revenue with the campuses on the back end.

In the spring of 1998 the UW Colleges made an agreement with the newly created UW Learning Innovations to begin development of courses that would be the foundation courses of an online Associate of Arts and Science degree. Beginning with 3 online courses enrolling 60 students in the Fall of1998, the program has grown to 17 courses and over 400 students in Spring 2001. In May of 2001 the UW Colleges received approval from the North Central Association for Higher Education for an Institutional Change, allowing the UW Colleges to offer the Associate of Arts and Science Degree totally online. The partnership with UWLI to provide the LRMS allowed the UW Colleges to successfully develop the AAS degree.

Learner Services

The key to offering a successful online degree program is quality learner or student services. To this end the UW Colleges and UW Learning Innovations has worked together to provide services to students enrolled on 13 campuses in Wisconsin and from around the United States. As the UWC Online program has grown, learner services have improved and retention rates have improved dramatically. The key was the development of a Learner Relationship Management System (LRMS) at UWLI. Features and services of the system and their relationship to UWC student services include:

Call Center/Pre-advising Service

Professionally staffed 800 number service to answer prospective learner questions about any of our services, the content of courses, costs, registration procedures, etc. This function serves as the "hub" of learner services to anticipate and meet learner needs for information and provides a seamless connection to all services of UWLI and the campuses.

Educational Advising

Professional advising staff members assist learners with education related problems. Advisers have access to information on majors and programs throughout the UW System to assist learners in planning career goals, facilitate credit transfer issues, answer questions about admission, degree completion, and many other processes and policies related to attending college in the UW System.

Help Desk Support

Provides a hybrid, toll-free service that combines the best of learner-centered advice and technical expertise to anticipate and resolve technical difficulties being experienced by learners.

Registration Services

Online catalog and scheduler function allows learner to select courses and add them to a schedule of classes. The process of creating a schedule culminates in an online registration process with payment possible through online credit card, billing or mail-in payment. Collection of tuition and fees, processing of add/drops, refunds and withdrawals.

Course Tracking

Ability to track learner progress through a course or module by recording lessons, exams, grades or other data related to course completion.

Administrative Website

Secure online access for authorized administrative staff or faculty to learner registration information, including course enrollment information, payment status, course roster, residency status etc. Provides the ability to download learner data to client/university databases.

Virtual Bookstore

Learners may purchase books online, by toll-free phone, fax or mail using credit card or mail-in payment. UWLI provides a staff person to faculty and program coordinators to manage book and material availability and information.

Learner Tracking

The LRMS tracks each learner interaction creating an "organizational memory" about that learner that is available to anyone who is working with him or her at that moment. This allows UWLI and the campus staff and faculty to be well informed about the learner's needs and provide a high degree of personal attention even at a distance.

Lessons Learned

Personal Contact

Learners expect personal contact and considerable personal support from application to graduation. As the programs have grown, we have expanded the hours of technical support and advising. Mailings to students, prior to the start of the semester, have be honed down to a manageable size and to the most critical information. All other course information has been integrated into the course sites.

Early Access to Course Sites.

By allowing students access to their course sites a week prior to the start of the semester, the number of technical difficulties during the first week of the semester has been reduced dramatically. Students can get into the course, make sure their computer, ISP, and browser are compatible with the course ware. They also have an opportunity to prepare for the workload expected and get a jump on the start of the semester. Faculty and students have both found this change to be very beneficial to everyone.

Summary

The collaboration between the UW Colleges and UW Learning Innovations has been a challenging, and exciting experience, most definitely an ongoing learning process. The lessons learned in the last three years have been invaluable to both institutions in the development of new collaborations. We look forward to more collaborations with institutions in Wisconsin and around the country. As the programs grow and we learn more, the LRMS becomes a valuable resource for both institutions.

Biographical Sketches

Patricia J. Fellows is the Director of Distance Education for the UW Colleges. Pat taught on the faculty of the UW Colleges for 18.5 years, served as a department chair, associate dean, and special assistant to the associate vice-chancellor. Prior to becoming the director of the distance education program, she was the instructional technologist working with faculty in the distance education program.

Address: UW Colleges
780 Regent Street
Madison, WI 53708
E-mail: pfellows@uwc.edu
URL: www.uwcolleges.com
Phone: (608) 263-3245
Fax: (608) 262-7872

Kris McGrew is the Director of Learner Services and the Higher Education Location Program (HELP) for UW Learning Innovations. She has been involved with various areas of student services in the UW System since 1977. She has been the Director of the HELP program, a UW System advising service, since 1988. After the creation of UW Learning Innovations, she also took on the responsibility for creating and shaping support services for distance learners in the UW System.

Address: University of Wisconsin Learning Innovations
505 Rosa Road Suite 200
Madison, WI 53719
E-mail: mcgrew@learn.uwsa.edu
URL: http://learn.wisconsin.edu/
Phone: (608) 263-2172
Fax: (608) 262-4096

Living in Virtual Rome:
Adventure@Cybercamp

Jack Fritts
Executive Director
Southeastern Wisconsin Information Technology Exchange

Bonnie Thurber
Project Consultant
The Collaboratory Project
Northwestern University

Michelle Bryce-Fritts
Environmental, Health, & Safety Coordinator
Regis Technologies

Living in Virtual Rome: Adventure@Cybercamp is an interactive learning experience designed to introduce middle school students to life in Rome between 70 – 120 A.D. Learning is accomplished through a combination of live and pre-planned interactions among student visitors and Roman characters. This project began as a collaborative classroom activity at the Baker Demonstration School of National-Louis University. It was initially designed as a MUSH and targeted for cross-curricular middle school level activities. The technology coordinator worked with the classroom teachers to incorporate all subject areas, including Latin, in the project. Students created their own Roman personae and assisted in the development of the shared environment.

As the project evolved, the focus shifted to a graphical environment and from a MUSH to a Multi-User Virtual Space (MUVS). This type of environment can be used to enhance learning experiences by providing learners with a common, shared environment in which to learn regardless of physical location. The MUVS, Continuum $2D_{tm}$ is a protected, interactive, on-line environment designed for global dialog and the development of interactive collaborative projects. Participants communicate with others while collaborating, acquiring technology skills, and learning about other cultures. The environment provides access to and opportunities for collaborative projects, multimedia presentations, student exploration, participant problem solving, and communication and role playing. Continuum $2D_{tm}$ supports and empowers educators to develop their own integrated collaborative lessons.

Participants in Living in Virtual Rome explore a series of user-created lessons designed for learning about language arts, math/sciences, and social studies/history. The interactive learning process allows students the freedom to communicate across boundaries and to develop their ideas within the framework of the environment. Students have the opportunity to create their own Roman personae and establish themselves as a part of the virtual Roman society. Once a persona is established, a student can travel around the city of Rome and learn about aspects of Roman culture and traditions including family life, business, architecture, and government. A chat capability allows for interaction with other visitors and with designers of the environment. A certain amount of interactivity has also been developed so that various non-player characters present useful information or data about daily life and activities while guiding users through the environment. Accompanying textual materials and resources guide students to deeper learning as appropriate.

The project is in an evolving state. An international core of users has participated in the ongoing development of the Roman environment. These users include educators and students who work collaboratively to develop and establish as realistic an environment as possible. On entry to the virtual space, a visitor is offered the choice of creating a persona or touring as a guest.

The content of material in Rome covers a large array of topics. It is actually hard not to learn when a participant progresses through the City. Some general computer skills are also taught for those still working on their computer literacy skills.

Fun and learning is the foundation of this adventure. Development of a persona incorporates various aspects of Roman culture. Exploration is done into Roman naming styles (e.g., praenomen, nomen, cognomen, male vs female, etc.) and clans (i.e., gens) that formed the backbone of much of Roman society. Assistance is provided in choosing an appropriate name. Learning about the classes (e.g., patricians, plebians, slaves, etc.) and the many types of professions performed by members of each class helps a participant choose what class and profession her character shall be.

From the average short, stocky, dark-curly haired Roman or almond-eyed, black-haired Easterner, to the muscular, flaxen-haired, blue-eyed Briton or the tall, lean ebony-skinned Nubian merchant, all variety of people from the then-known world visited and lived in Rome. With the variety of social roles and types of employment available to children and adults, males and females, and multiple classes, a visitor need not be restricted by his own sex, age, or culture when exploring Rome under a created persona. Personas may be individualized to accommodate the visions of the Cybercamp adventurer.

From the corner bakery to the basket-sellers in the Forum, visitors to Rome can learn about commerce, trade, and various types of work performed in Rome. From the aqueducts to the racecourses (i.e. circuses), participants can learn how architecture impacted Roman society. "Bread and Circuses" had a real meaning to the citizens of Rome.

Activities provided throughout Rome enhance the learning process. A day at the Circus includes exercises in mathematics and probability. Participants can experience wedding celebrations, family experiences, and funeral practices.

Planning a Roman banquet is a fun way for a group of participants to interact and learn about commerce, planning, food, entertainment, and the Roman culture. Other activities are included and suggested in the companion student and teacher guides.

Living in Rome: Adventure@Cybercamp is the first of a projected series of interactive, web-based books and virtual spaces that contain, support and illustrate activities that have been used by master teachers over the years to help students experience history in a more hands-on way. It has been written with an interactive multi-user virtual space so that students can experience and participate in ancient Roman life in real time.

Biographical Sketches

Jack Fritts is the executive director of the SWITCH Consortium in Milwaukee, Wisconsin. He has been a teacher, a school librarian and an academic librarian. He has taught children and adults in a variety of subject areas. He is actively involved in the Distance Learning Section of the Association of College and Research Libraries and has done presentations on varied aspects of distance learning library services including administrative and accreditation issues, guidelines for distance learning library services, and research in distance learning. He also collaborates on teacher training workshops and presentations on the uses of technology in the curriculum.

Address: Southeastern Wisconsin Information Technology Exchange (SWITCH)
6801 N. Yates Rd.
Milwaukee, WI 53217
E-mail: jfri@switchinc.org
Phone: (414) 351-2423
Fax: (414) 228-4146

Bonnie Thurber is a project consultant at the Collaboratory at Northwestern University. The Collaboratory Project is a Northwestern University initiative designed to help educational, cultural, and nonprofit organizations use network technologies to advance education in the greater Chicago region. Bonnie Thurber has been a presenter at numerous local, regional, national and international conferences including WebNet 98 and 2000, NECC 1992 - NECC 2000. She is a coordinator for Kidlink, an international program designed to foster cross-cultural communication among students. She is also co-chair of NECC 2001 in Chicago. Bonnie Thurber is co-author of Living in Virtual Rome: Adventure@Cybercamp, which is the first in a projected series of text/web experiences designed to introduce students to world history and culture.

Address: The Collaboratory Project
Northwestern University
1890 Maple Ave. Suite 175
Evanston, IL 60201
E-mail: b-thurber@nwu.edu
Phone: (847) 467-6734
Fax: 847-467-7885

Michelle Bryce-Fritts is the Environmental, Health, and Safety Coordinator for Regis Technologies in Morton Grove, Illinois. She is responsible for developing and implementing training programs in chemical and workplace safety. She is a Certified Hazardous Materials Manager (CHMM) and conducts certification training workshops. She is a member of the conference planning committee for the Academy of Certified Hazardous Materials Managers 2001 national conference, and is chair of the Local Arrangements Committee. She has conducted test preparation seminars for Wright College in Chicago and for the American Society of Safety Engineers at their annual conferences in Orlando, Florida and Anaheim, California. Michelle Bryce-Fritts is co-author of Living in Virtual Rome: Adventure@Cybercamp.

Address: Regis Technologies
8210 N. Austin Ave.
Morton Grove, IL 60053
E-mail: mdbf@registech.com
Phone: (847) 967-6000 Ext.667
Fax: (847) 967-5867

Astronomy for 10-Year-Olds

H. Geissinger
Coordinator, Astronomy in the Schools
School of Teacher Education
Charles Sturt University, Australia

D. McKinnon
Manager, Astronomy in the Schools
School of Teacher Education
Charles Sturt University, Australia

Knowledge and understanding about Science are important to all members of society. It should be taught well (and learned and reflected upon) all through an individual's school days. Teaching about Science is not always effective because teachers may not be able to provide all the practical experiments that make meaning out of concepts. Science may not be attractive to students and many do not perceive their study as the basis for a future career. The *Astronomy in the Schools* project has been developed in the hope that the interest many young students have in stars and space travel can be channelled into an exciting, deep-level learning experience that leads to a lifelong interest in "what's up there". Because it is important that young children gain an interest in Science and take charge of their explorations of scientific topics, the *Astronomy* project is provided in several phases, the first of which is to teach Astronomy to children in Years (Grades) 5 and 6. The learning activities in Phase 1 allow children to decide on their study of specific objects in the Universe while acquiring knowledge of scientific methods. Those provided for the next phase, Years (Grades) 7 and 8 advance their knowledge and skills at a level appropriate for the age group. The material for Years (Grades) 11 and 12 helps students develop adult-level projects that may carry into university study in Physics or another science.

The *Astronomy in the Schools* project uses the internet to allow students in their own schools to take control of a scientific-grade telescope and an attached camera to find celestial objects and photograph them. Learning about Astronomy through the use of computers contributes to children's development of information technology skills. Although the availability of computers is now almost taken for granted in schools in the developed world, educational applications have not kept up with the spread of the technology. There is some excellent software and some innovative uses have been developed but, by and large, students go on the internet to search for information that they then wordprocess into assignments or projects. Their activity often translates into doing screen dumps and making good-looking projects with other people's graphics and words. The skills they have learned consist of search, acquisition, wordprocessing and presentation. They may accomplish the work in groups or as individuals, but they may not learn as much about the topic as they learn to make their findings look attractive.

The project described below has been developed to help children in Grades 5 and 6 learn about the science of Astronomy as well as learning some science skills. They must use a computer in their school, connect it to the internet, go through the procedures to contact a computerized telescope in Bathurst, Australia and then point the telescope at an object in the sky for which they have the coordinates. Once they have located the desired object, they then decide how to capture an image of it using one of the telescope's attached cameras. To reach this decision point, the students must have learned something about the celestial object and its properties. So, even though the students might be in Grade 5 or Grade 6, they must develop some science and technological skills to study a star, nebula or other object in the sky. As an outcome, they download the images they have obtained and process them into striking photographs – evidence that they have acquired sufficient skills to perform a number of technical feats.

Teaching With the Telescope

The methods that teachers use in working with children in Grades 5 and 6 can range from the 'transmission' approach (i.e., children are empty vessels to be filled with knowledge) through to social constructivist approaches in which the teacher is the guide and facilitator. In the latter, children engage with learning methods that provide them with sources of knowledge and active exploration of the knowledge area through practical activities that help them understand what they are learning. These learning activities are followed by reflection on, and consolidation of, their understandings so they have a basis upon which to build new learning. The constructivist approach can be quite time-consuming for teachers to establish, as it requires them to find and make available a great number of resources as part of the learning support and to support the flexibility that permits a spectrum of activities to occur simultaneously.

The *Astronomy in the Schools* project that has been established in Australia depends on constructivism to encourage children to learn about Astronomy because the originator/manager of the project holds a firm belief that children learn most effectively 'by doing'. This belief is founded on his experience as a teacher and his conclusion, based on observation, that children in elementary school need both adult guidance and practical activities when they learn. Children's acquisition and retention of understanding is most effective when they can engage in practical work that gives them opportunities to explore, experiment and develop skills. Accordingly, at its core, the *Astronomy* project consists of a scientific-grade telescope and software that allows it to be controlled by a user who has access to the internet, locates the telescope website and uses their PIN. The telescope is thus available to children in classrooms that can access the 'net. Because simple access is no ticket to understanding, a learning package has been developed to provide a teachers' guide, a CD-ROM, a video and a website, all of which support learning about Astronomy.

One difficulty that primary/elementary school teachers face when teaching about astronomy is the need for students to return to the school at night to carry out observations. This is a major problem for teachers who actually implement practical astronomy work with students of this age group. Thus, many teachers choose to do something in astronomy or space science that is located in the research context and can be accomplished through students' finding information on the internet or in books in the school library. These research exercises can be presented to the teacher and the class as posters or formatted for the computer screen. Students learn how to present material but do not necessarily learn the content of the research topic. The *Astronomy* project is particularly useful to teachers in the Northern Hemisphere because the practical work of object location, observation and photography can occur during regular school hours. Obviously, teachers in the same or adjacent time zones as the telescope must ask their students to return to school at night. In this case, it is helpful if parents are interested in the astronomy project because they can included in the observation sessions and their presence at the school can make the teacher's task somewhat easier.

Using the learning activities, students learn about the sky and what is up there – the objects of the Universe and the debris (both from cosmic events and humans' attempts at space travel). Although taking photographs is easy for a participant using the telescope and its camera, the class has to decide what photographs to obtain. Some objects are interesting to them but may not be visible at the time of year they are doing the work. The chosen objects have to be visible to the camera, not necessarily to them in their own time zone, so students must learn about Earth time and latitude, as well as determining the coordinates of the celestial object so they can direct the telescope to centre it in the field. Once the images are captured and saved to the students' computer, they can be processed to produce striking pictures that they normally see in published books or on the Web. They have done it all by themselves so, besides the motivation they usually have about learning about Space, they gain self-esteem from making that team effort to find celestial objects and obtain acceptable images of them. The processes involved in determining the objects to examine are used as stimuli for classroom writing and activities in other areas of the curriculum, e.g. in creative and practical arts and mathematics where students create scale models and diagrams of their calculations of the sizes of the planets and the solar system.

The teachers' guide for Grades (Years) 5 and 6 has been developed to provide exposure to concepts of Astronomy understandable to this age group as interpreted through the Six Key Learning Areas in the Australian syllabus: Science & Technology, English, Mathematics, Human Society in its Environment, Creative & Practical Arts, and Health/Physical Education. With this approach, a teacher can choose to devote a 10-week period to using the activities in the guide to cover all parts of the curriculum. The guide contains 34 Missions, each of which contains a variety of activities. Some activities require as much as a month to complete, as they include research, journal writing and daily observations. Others can be completed within a day.

The Missions can be followed as they are laid out or can be divided into smaller units of work to mesh with other learning in which the teacher wants the class to engage. The Missions help students determine what they want to look at through the telescope and decide when and what they will photograph. Because these activities require the participation of the whole class, each child takes a knowledgeable stance and contributes to decision-making. The ultimate Mission in the learning/teaching sequence requires that the students present their work to their peers in other classes and to their parents. Students use presentation software such as PowerPoint™ to display the outcomes of their research and practical activities, including their excellent attempts at image processing.

The learning package that teachers receive when they sign on with the *Astronomy in the Schools* project includes – besides the teachers' guide—a CD-ROM containing technical information and a video that 'walks' visual learners around the observatory so they can see the astronomy-related equipment and see how it works with the software. The package is supported by a website that contains the same technical information as the CD and even more details in-depth, a gallery of images taken by telescope cameras, and a teachers' section of learning activities, tips and a chatroom. Email can be sent to the project manager, the co-author of this paper who is also a Science teacher. The website (http://www.csu.edu.au/telescope) showcases images taken by schoolchildren with appropriate credit information. The current picture is replaced on a regular basis. Students are thrilled when they see a photograph that their class took displayed on the internet.

The Learning

This telescope website is accessed often by students to use its resources, such as informative URLs (unique resource locators, or web addresses). They are very interested in the URLs for educational NASA sites, play the games they find there, and engage in informal competitions based on the feedback provided by the games. For example, wordsearch puzzles for astronomy and space terminology give feedback on the length of time a participant required to complete a puzzle. Students compete to increase their word recognition and reduce their puzzle-solving time.

Teachers have found that students at this level require significant scaffolding in order to understand the ideas related to scale diagrams and models. For example, in drawing a scale model of the solar system with a scale of 1 mm=1 million kilometres, the sun is a dot 1.3 mm in diameter, Mercury is 5.9 metres away and the closest star system to Earth (alpha Centauri) is a distance of 40 km. Students encounter significant difficulties in coming to terms with this mathematical relationship. The difficulty with comprehension of scales necessitates that the teacher leads the activity.

Teachers' questions and many questions asked by the students that the teacher cannot answer are referred to the co-author of this paper, Dr McKinnon. For example, some students asked how one knows the difference between an asteroid and a planet. The query was based on their discovery that Pluto is not much larger than some asteroids. Others want to know how long we have on the Earth before it is incinerated by the sun as it turns into a red giant. And others want to know the likely fate of the universe or ask about super-massive black holes at the centres of galaxies and want to know what will happen to us as the Milky Way's black hole grows. These queries reveal the thinking in which students at this level engage when they are interested in the meaning of the material they discover. Students' responses to the answers they received show that students at this age think there must be answers to all questions, whether they are difficult or not. When McKinnon replied that the Pluto/asteroid question was dependent on the definition held by the particular astronomer, that answer was not acceptable to the students. They wanted to look elsewhere and find someone with the 'right' answer. However, the fact that the 'fate of the universe' question could not really be answered was not a problem to them when the timescale of the universe was discussed. Once they realized the millions of years required for the universe to go through the postulated evolution, they realized they could wait until they were older to look into the question again. This example highlights the problem children have in understanding scale and how it is represented in numbers. An early addition to the learning package must include more activities to help children understand scaling.

A series of activities is necessary for a class of students to develop a proposal for time on the telescope. These include learning/understanding about time zones, the objects in the Universe, and what is visible in the sky above the telescope at the time they may wish to take control. They make informed choices about the objects they wish to image and engage in class debates about the sequence of those images. The latter activity is done in a typical scientific way with small groups of students researching the objects they wish to image. In the whole class situation, each group presents their arguments for imaging the objects they have chosen, subject to visibility criteria, etc. The class then votes on the merits of the arguments promulgated and creates a list of high, medium and low priority objects to be imaged. When the class logs on to the telescope, a project technician is available online to offer help if it is required, but students take control and do the planned work.

Summary

The Astronomy project is accessible to teachers and children from Grades 5 and 6 on up because the technology required to take control of the telescope is easy to access. Astronomy as a knowledge area is accessible because students are motivated to learn about it and their strong interest is supported by a learning package developed for the age group. Teachers who worry that the technology will be beyond the reach of elementary schools are impressed by hands-on sessions that give them a chance to explore the project before they sign on. Those who identify as 'technophobes' discover that the technical support supplied with the package can carry them through their difficulties so they, too, can access the telescope and see celestial objects on their own computer screens.

Both teachers and students express real satisfaction with the results they obtain from working with the learning package. For example, one school has two Year Five classes working on the telescope in the Australian 2001 autumn. The teachers are amazed at the willingness of their students to engage with the learning activities and carry on their discoveries in their own time. The students' insightful questions keep the teachers learning also. Whether or not the students of today will have a lifelong interest in Astronomy and outer space remains to be seen. The seed has been sown . . .

Biographical Sketches

Helen Geissinger is the project coordinator for the *Astronomy in the Schools* program. She brings to the program her skills in the design of flexible learning gained through work in the areas of distance education and learning with computers. She is a strong believer in the design of educational materials that will help learners manage their own learning, as appropriate for their age group.

Address: School of Teacher Education
Charles Sturt University
Panorama Avenue
Bathurst NSW Australia 2795
E-mail: imed@ozemail.com.au
URL: http://www.csu.edu.au/telescope
Phone: 61 2 6338 4235

David McKinnon is the originator of the Telescope project. He is Associate Professor of Online Teaching & Learning in the Faculty of Education at Charles Sturt University and lectures in research methods and science education. He has a lifelong passion for Astronomy.

Address: School of Teacher Education
Charles Sturt University
Panorama Avenue
Bathurst NSW Australia 2795
E-mail: dmckinnon@csu.edu.au
URL: http://www.csu.edu.au/telescope
Phone: 61 2 6338 4235
Fax: 61 2 6338 4417

Understanding Designs and Improving the Design Process Through a Layered Approach

Andrew S. Gibbons
and
Joel Duffin
Utah State University

A question we ask Instructional Technology students at Utah State University is, "What do instructional designers design?" We have had interesting discussions on this question. The students' perceptions of what instructional designers design changes over time. This is no doubt a product of the faculty's teaching, but it also represents a personal commitment that the student makes. What the student commits to is what we would like to discuss. Our thesis will be that it is a commitment to a particular layer of the evolving instructional design. We will talk about the layering of instructional designs and the implications for both teaching and practicing instructional design.

"The Centrisms"

Here are some of the phases we see students evolving through as they mature in their theoretic and practical knowledge:

Media-Centrism

Media-centric designs place great emphasis on the constructs related to the instructional medium. The technology itself holds great attraction for new designers. They often construct their designs in the vocabulary of the medium rather than seeing the medium as a plastic and preferably invisible channel for learning interaction (See Norman, 1988; 1999). We are currently experiencing a wave of new media-centric designers due to the accessibility of powerful multimedia tools and large numbers of designers "assigned into" computer-based and Web-based training design. Most of these designers speak in terms of the medium's constructs (the "page," the "hyperlink," the "site," etc.) as the major design building blocks. Many struggle as they attempt to apply inadequate thought tools to complex design problems.

Message-Centrism

Realizing that media design building blocks do not automatically lead to effective designs, most designers begin to concentrate on "telling the message better" in order to "get the idea across" or "make it stick." This is a phase we call message-centrism. Message-centric design places primary importance on message-related constructs and employs media constructs—main idea, explanation, line of argument, dramatization, etc.— secondarily, according to the demands of the message. The media constructs are used, but they are used to serve the needs of better messaging. Better message "telling" means different things to different designers: providing better illustrations, using animations, wording the message differently, using analogies, or focusing learner attention using attention-focusing questions, emphasis marks, repetition, or increased "interactivity."

Strategy-Centrism

Message-centrism is normally followed by a recognition of underlying structural similarities within messages and interactions that cross subject-matter boundaries and that have important instructional implications. This leads to a new viewpoint we call strategy-centric design thinking. Strategy-centrism considers the structured plan of messaging and interaction as a main source of instructional effectiveness. Therefore, the designer's first attention is to strategic constructs that are appropriate to instruction in categorized varieties of learning. Strategy-centric design can be viewed as the use of rules to governing the delivery of compartmentalized information and interaction elements (Gagne, 1985; Merrill, 1994). This can be a very useful conception for both the designer and the learner, and structured strategy is an important key to logic templating and design automation.

Model-Centrism

Whereas strategy centrism permits the use of instructional experts (Zhang, Gibbons, & Merrill, 1997), it does not lead the designer to design interactive micro-worlds in which instruction can take place through problem solving. This realization leads to model-centered design thinking. Model centering encourages the designer to think first in terms of the system and model constructs that lie at the base of subject-matter knowledge. The designer therefore gives first consideration to identifying, capturing, and representing in interactive form the substance these constructs. Then to this base of design is added strategy, message, and media constructs. Model-centrism is the common thread running through virtually all new-paradigm instructional approaches (for a review, see Gibbons & Fairweather, 2000). Many current researchers consider learning to be a problem-solving activity (Anderson, 1993; Brown & Palincsar, 1989; Schank, 1994; VanLehn, 1993). If this view is correct, then the designer must also give first preference to decisions about the problems the learner will be asked to solve. A model-centered view prescribes instructional augmentations that support problem solving in the form of coaching and feedback systems, representation systems, control systems, scope dynamics, and embedded didactics (see Gibbons, Fairweather, Anderson, & Merrill, 1997).

These phases in the maturation of design thinking tend to be encountered by new designers in the same order, and one could make the argument that these phases describe the history of research interests in the field of instructional technology as a whole. A good place to see this trend in cross-section is the articles in the *Annual Review of Psychology*.

Roots of the "Centrisms"

We are interested in this paper in exploring the roots of this progression. Important clues can be found in design areas outside of *instructional* design. A provocative statement on design structure is given by Brand (1994) in a description of how buildings are seen by architects and structural engineers. Brand begins by stating that architects see a building as a system of layers rather than as a unitary designed entity. He names six general layers described below in his own words:

- SITE – This is the geographical setting, the urban location, and the legally defined lot, whose boundaries and context outlast generations of ephemeral buildings. "Site is eternal," Duffy agrees.
- STRUCTURE – The foundation and load-bearing elements are perilous and expensive to change, so people don't. These **are** the building. Structural life ranges from 30 to 300 years (but few buildings make it past 60, for other reasons).
- SKIN – Exterior surfaces now change every 20 years or so, to keep with fashion and technology, or for wholesale repair. Recent focus on energy costs has led to reengineered Skins that are air-tight and better insulated.
- SERVICES – These are the working guts of a building: communications wiring, electrical wiring, plumbing, sprinkler system, HVAC (heating, ventilating, air conditioning), and moving parts like elevators and escalators. They wear out or obsolesce every 7 to 15 years. Many buildings are demolished early if their outdated systems are too deeply embedded to replace easily.
- SPACE PLAN – The interior layout—where walls, ceilings, floors, and doors go. Turbulent commercial space can change every 3 years or so; exceptionally quiet homes might wait 30 years.
- STUFF – Chairs, desks, phones, pictures, kitchen appliances, lamps, hair brushes; all the things that twitch around daily to monthly. Furniture is called **mobilia** in Italian for good reason. (p. 13)

Brand pointed out some important implications of the layered view of design:

- That layers of a design age at different rates
- That layers must be replaced or modified on different time schedules
- That the layers must be articulated with each other somehow
- That designs should provide for articulation in such a way that change to one layer entails minimum disruption to the others.

In work for the Center for Human-Systems Simulation with colleagues Jon Nelson and Bob Richards, we have applied Brand's ideas to instructional design (Gibbons, Nelson & Richards, 2000). We have found that instructional designs can indeed be conceived of as multiple layers of decision making with respect to different sets of design constructs, and we find a rough correspondence between the layers and the phases of designer thinking already described. Gibbons, Lawless, Anderson and Duffin (2001) showed how layers of a design are compressed at a "convergence zone" with tool constructs that give them real existence and embody them in a product.

We think the most important layers of an instructional design are: model/content, strategy, control, message, representation, media-logic, and management. Each layer is characterized by the following:

- A set of design goals unique to the layer
- A set of design constructs unique to the layer
- A set of theoretic principles for the selection, use, and relation of design constructs
- A set of design and development tools
- A set of specialized design processes
- A set of distinct skills used by designers within the layer
- A set of standards that apply to within-layer designs

A layer often corresponds with a set of specialized design skills with its own lore, design heuristics, technical data, measurements, algorithms, and practical considerations. The boundaries of these skills over time tend to harden into lines of labor division, especially as technical sophistication of tools and techniques increases.

More detailed principles of design layering are outlined in Gibbons, Nelson, and Richards (2000). The purpose of the present paper is to show how design layering influences the designer's thinking and allows it to change over time into entirely new ways of approaching the design task. The media-, message-, strategy-, and model-centric phases designers experience can be explained as the necessary focus of the designer first and foremost on a particular layer of the design. That is, the designer enters the design at the layer most important to the design or with which the designer is most familiar and comfortable.

Media-centric designers do not ignore decisions related to other layers, but because they may not yet be fully acquainted with the principles of design at other layers, they naturally think in terms of the structures they do know or can acquire most rapidly—media structures. As designers become aware of principles at other layers through experience and the evaluation of their own designs, focus can shift to the constructs of the different layers: message structurings, strategy structurings, and model and content structurings. Each step of the progression in turn gives the designer a new set of constructs and structuring principles to which to give the most attention, with other layers of the design being determined secondarily, but not ignored.

Is there a "right" layer priority in designs? Should designers always be counseled to enter the design task with a particular layer in mind? It is not possible to say that, because design tasks most often come with constraints attached, and one of those constraints may predetermine a primary focus on a layer. An assignment to create a set of videotapes will lead the designer to pay first and last attention to the media-logic and representation layers, and other layers are forced to comply with the constraint within the limits of the designer's ingenuity.

Conclusion

The design layering concept has many implications. In this paper we have explored one of them that explains the maturation in designer thinking over time. In order to move to a new perspective of design it is not necessary to leave older views behind. The new principles added as the designer becomes knowledgeable about each new layer adds to the designer's range and to the sophistication of the designs that are possible. Further consideration of the layering concept will expand our ability to communicate designs in richer detail, achieve more sophisticated designs, and add to our understanding of the design process itself.

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Biographical Sketches

Dr. Andrew S. Gibbons combines 18 years of industry design and consulting experience with academic interests in theories of product architectures, design process, and model-centered instruction. His work also explores high-volume production of innovative instructional forms and the application of advanced pedagogic, design, and production concepts by new designers.

Address: Instructional Technology
Utah State University
2830 Old Main Hill
Logan, UT 84322-2830
E-mail: gibbons@cc.usu.edu
URL: http://www.usu.edu/~gibbons/
Phone: (435) 797-2393
Fax: (435) 797-2693

Joel Duffin is an instructional designer and java/website developer for an NSF-funded project, creating learning objects for interactive math instruction (see http://matti.usu.edu/). Joel has seven years experience programming instructional software, including the creation of a modular intelligent critic that creates adaptive feedback dynamically following simulation problem solving. He will soon complete his doctoral studies focusing on instructional software architecture and adaptive problem sequencing.

Address: Instructional Technology
Utah State University
2830 Old Main Hill
Logan, UT 84322-2830
E-mail: jwduffin@yahoo.com
Phone: (435) 797-2694
Fax: (435) 797-2693

"The Year of the Cohort"
The Impact of Collaborative Learning from the Students' Perspective

Lois S. Hale
Chair, Department of Behavioral Science
The University of Texas of the Permian Basin

Amy Campbell
Assistant Director, Office for Teaching and Learning
Wayne State University

Everett "Ev" Corum
Director, ArtsEdge
The John F. Kennedy Center for the Performing Arts

The Distance Education Certificate Program offered through the University of Wisconsin-Madison is a professional development curriculum designed to build knowledge, skills, and leadership in distance education and training. The program is offered in both self-paced and online collaborative versions. The twenty-five participants in the Collaborative Learning Group (CLG), fondly referred as the October 2000 Cohort, include trainers, instructional designers, distance education administrators, consultants, and faculty. The participants are from a variety of educational and business settings, and they vary greatly in the nature and the extent of their distance education experiences. The members of the October 2000 Cohort invite you to share their experience in "The Year of the Cohort."

The focus of this paper is on how participating in the online CLG has influenced the Cohort members' distance education practices. The primary purpose is to describe how the lessons learned from being students in these online courses have influenced (a) their attitudes toward collaborative learning, (b) the design of their own online courses, (c) the development of their online facilitation skills, and (d) the nature of the faculty training and other support services they provide.

Nature of the Collaborative Experience

As students in the online CLG, members of the Cohort have engaged in a yearlong series of four- and six-week online courses that feature highly interactive group learning activities. These online learning activities are designed to stimulate critical thinking and concept application through discussions, debates, case studies, group projects, and other online exercises. Many of these learning experiences were of a small group, collaborative nature. Some examples of the activities follow:

- Create a list of "Top 10" recommendations for improving persistence for distance learners
- Create a guide for using various distance education technologies effectively
- Analyze a mini-case study of distance education use in a large corporation
- Review an online course with regard to its use of active learning
- Role-play distance learning consultants and advise regarding an online learning problem
- Design and present a unit of instruction using Instructional Systems Design concepts
- Participate in an online text-based debate about the nature of online moderating skills
- Design elements of an online program evaluation

Since the Cohort students are learning about online instruction through participation in online courses, they have not only been exposed to theory, research, readings, and illustrations, but their Certificate program instructors and courses have served as models of online instruction. The interaction of distance education content with distance education delivery has provided a powerful learning experience.

Attitudes Toward Collaborative Learning

For many of the Cohort members, learning in online collaborative groups was a new experience. Thus, they had no preconceived ideas about online collaborative learning or its benefits. The overall response to collaborative learning was positive, with many Cohort members noting how supportive the groups were, both personally and professionally. Members of the Cohort who began the Certificate Program in the alternative, self-paced mode also mentioned the role of the Cohort and the group activities in increasing their completion rates for Certificate courses. Some responses from Cohort members follow:

> *"When I began this whole Certificate program, I didn't understand the importance of student-to-student interaction....I cannot tell you how wonderful it is to learn from so many excellent teachers like [yourselves]."*
> *"As a learner in these groups, I felt an active PART of the class, rather than just as if I were doing the work to do the work."*
> *"I can hardly wait to teach my own first online course. As a student now, I will be able to relate better to my students in the future, including informing them of what they can expect from me."*
> *"I have considered the cohort group as consultants...with whom I can ask any question...and from whom I know I will get some great advice."*
> *"Asynchronous communication is not a one-way street: you must strive to contribute as much information as you gain from your cohort. It's exhausting and exhilarating."*
> *"I experienced a transformation in thinking – I learned to 'think in asynch.'"*
> *"I believe that the cohort online collaborative experience is unique and must be experienced to be understood."*

Although, as mentioned, overall the experiences with the collaborative groups were reported as positive, some frustrations persisted. In particular, Cohort members developed strategies for encouraging participation and decreasing lurking based on their own experiences as students in the groups. Some of these strategies are described in the section below, "Implications for the Design of Online Courses."

Implications for the Design of Online Courses

Cohort members were exposed to different models of online course design during their participation in the Certificate Program and from these developed their own ideas of "dos" and "don'ts" for successful online course design and implementation. In this program, frustrating online experiences were also useful as learning tools, informing the participants nearly as much as pleasant experiences. All of the participants are extremely interested in distilling ideas for effective online instruction, particularly the implementation of collaborative learning experiences. The ideas expressed below center around three basic themes: instructors and group facilitators must be explicit about their wishes, course design should include learner-centered group-based activities, and instructors should plan many methods for building online communities in their courses.

> *"My inclination as the instructor in the online courses I deliver will be to provide lots of structure and support early in the course. Initial collaborative assignments will be relatively simple and straightforward. Roles within the small groups will be explicit."*

> *"It is important that the group is fully informed about the activity, the outcome expected for the activity, and the roles that each group member will play during the activity. This is especially important for the facilitator so that the group will be able to meet any deadlines that are assigned. To assist in this, provide a brief outline of the "responsibilities" of the facilitator and the group members during the activity... It will also be important [at least at first] for the instructor to assign a facilitator for a group project."*

"...our instructor-facilitators built group activities in which we created something of professional worth. Since I design courses for adult learners (faculty), I feel comfortable modeling my courses after the Certificate courses, designing them so that the participants are truly collaborators in the instruction."

"Using the same approach for every project may get boring for the students, and may not provide them with the richest online experience. Also, if using multiple projects during the course—consider whether the same group should function as a group for the entire course—or whether they might benefit from group membership being shuffled during the course."

"Don't underestimate the importance of participant rosters, introductory activities, and other forms of self-disclosure. They are critical to successful collaborative group functioning."

Implications for Instructor Facilitation and Moderating Skills

As the Certificate Program courses demonstrated multiple models of course design, so, too, did the course facilitators model different styles of online facilitation. All courses were to some degree constructivist and learner-centered, yet still had a timeline and a specified set of topics. Within that framework, some instructors were more active, others demonstrated a more "hands-off," yet friendly, style. For example, one instructor would respond to participant posts quite frequently; others did so mainly to answer direct questions or to offer clarifications when they felt it necessary.

Instructors presented different conversational styles, as well. For example, some instructors affected a very informal style and used many emoticons and icons to convey expression. Others were more formal and structured in their correspondence. From experiencing the facilitation styles of their multiple instructors, as well as practicing as group facilitators themselves, Cohort members absorbed a great deal about effective online facilitation. The variety in style, in addition to providing multiple models to emulate, also provided food for thought regarding the *reasons* for the differences.

"Intentionally or not, every coordinator thus far has given us a different model of delivering an online course; that's incredible."

"What particularly interests me is whether the [Certificate Program instructor] styles of moderating/facilitating stem from conscious decisions based on philosophies of instruction or if they are based on some other internal variables (e.g., personality dispositions, personal experiences as online learners) and/or external pressures (e.g., time constraints, imposed priorities)."

"I know I have learned to teach others and to practice for myself, to clearly state how much, how, when, why, etc. I will participate as an instructor in the discussions."

"...it is of great value to have the instructor-moderator model the conferencing behaviors she desires from her students. As a student, I have even found myself picking up phrases that the instructor-moderators used (e.g., 'musings on a Monday morning')."

"With collaborative learning experiences, the student-facilitator role is critical. As the instructor, recognize the facilitators' tendency to do it all and their frustration with non-participants. Provide them with the skills necessary to avoid or at least reduce both. To improve the quality of collaborative learning experiences within a constructivist approach, more time should be spent on building teamwork and establishing guidelines for small group functioning, including the consequences for violating those guidelines."

"In the past, I tended to look to the instructor as the expert on content. Now, I see the instructor as a facilitator, coach and moderator."

Implications for Faculty Training and Other Distance Education Support Services

Several of the Cohort members are, either formally or informally, involved in faculty support in distance education. This may involve anything from instruction about online teaching, to support and consultation about instructional design issues, to technical support for online teaching. Cohort members all felt that having actually "done it" (been an online student) strengthens their credibility with faculty. Their experiences also confirmed their beliefs that faculty should experience being an online student before teaching online. Finally, after a year's experience with some of the *technologies* of online learning, the Cohort members are more cognizant of advantages and limitations of those technologies, and *technologically* what it takes to learn online.

> *"Taking the Certificate Program confirms my belief that anyone planning to teach online should take a real online course first. Faculty who believe that online courses are 'distant' would understand that is only the case if they are designed that way."*
>
> *"I realize that many people at our university are confused about distance education...I think an online short course will offer a sound introduction and help dispel many common misconceptions."*
>
> *"My goal is to help the instructors who do not include student-student interaction to 'see the light'."*
>
> *"Positive collaborative learning experiences are influenced by the nature of the conferencing technology and the availability of collaborative tools. For example, one of the limitations of WebCT is that you don't know who is online posting. That feature would make working on a small group project less cumbersome."*

Primary Areas of Continuing Concern

While members of the Cohort are convinced of the overall value of online collaborative learning experiences, they are also convinced that there are issues that must be addressed for the potential value of such experiences to be fully realized. Those areas of primary concern are: (a) limited or non-participation by some team members, (b) unclear consequences for unacceptable levels of participation, (c) ambiguous project instructions, (d) inadequate instructor or peer evaluation of group process and product, (d) awkward collaboration tools, and (e) the need for computer access at work, at home, and while traveling. Collaborative learning experiences are most effective when learners log in at least twice a day, seven days a week, and keep other team members informed about their schedules. While this may be an unrealistic expectation for students, complex group projects with short time-lines almost demand such high levels of interaction. The ability to directly and clearly communicate ideas and the willingness to question and disagree without being disagreeable are participant characteristics that can do much to advance the quality of the collaborative learning experience. Valuing the contributions made by team members and maintaining a sense of humor can often counter other inadequacies. Skillful instructor-facilitation, careful design of learning experiences, and the use of appropriate technologies will mediate many concerns and frustrations with collaborative learning experiences, but there is room for improvement.

Conclusions

Although the "Year of the Cohort" is drawing to a close, the CLG participants will continue to be involved in the development and delivery of online instruction. Their experiences in the CLG have convinced them of the value of collaborative learning, especially in the online environment. The lessons learned from being students in these online courses have influenced their attitudes toward collaborative learning, the design of their own online courses, the development of their online facilitation skills, and the nature of the faculty training and other support services they provide.

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Biographical Sketches

Lois Hale is Chair of the Department of Behavioral Science at The University of Texas of the Permian Basin. She is also Chair of the Academic Affairs Committee for a completely online master's degree in Kinesiology. Lois holds a Ph.D. in Sport Psychology from Temple University and is completing Distance Education Certificate Program at the University of Wisconsin, Madison.

Address: University of Texas – Permian Basin
Odessa, TX 79762
E-mail: Hale_L@utpb.edu
Phone: (915) 552-2334
Fax: (915) 552-3325

Amy Campbell is the Assistant Director in the Office for Teaching and Learning, a faculty teaching support office at Wayne State University. She consults with and leads monthly workshops for faculty on a number of topics, including online teaching and learning. Amy holds an M.S. in Ecology and Evolution from University of Michigan and is completing the Distance Education Certificate Program at the University of Wisconsin, Madison.

Address: Office for Teaching and Learning
Wayne State University
Detroit, MI 48202
E-mail: aa2926@wayne.edu
Ph[illegible] (313) 577-6512
Fax: (313) 577-7578

Ev Corum is the newly appointed Director of ArtsEdge, the online K-12 arts education program at The John F. Kennedy Center for the Performing Arts in Washington, D.C. Prior to that, he was on the Theatre Arts faculty and was the Distance Education Coordinator at Interlochen Center for the Arts in Michigan. Ev has a Ph.D. in Theatre and Media Arts from the University of Kansas (1990) and soon hopes to complete the DE Certificate program at the University of Wisconsin, Madison.

Address: ArtsEdge
The John F. Kennedy Center for Performing Arts
Washington, D.C. 20566-0001
E-Mail: ev@artsedge.kennedy–center.org
Phone: (202) 416-8872
Fax: (202) 416-8876

Web Design Guidelines for Web-Based Instruction

Cheryl J. Hamel, Ph.D.
Senior Research Associate
University of Central Florida

David Ryan-Jones, Ph.D.
Senior Research Psychologist
Naval Air Warfare Center Training Systems Division
and
Joint Advanced Distributed Learning Co-Laboratory

Web-based instruction (WBI) is becoming increasingly popular. However, WBI may burden learners with the additional problem of interacting with a computer system during the learning task. Operation of the computer system through the user interface has been shown to affect many cognitive components of the instructional environment, including attending, memorizing, strategizing, problem-solving, and ultimately learning itself (Guttormsen Schar, Schluep, Schierz, & Krueger, 2000). Danielson, Lockee & Burton (2000) argue that the user interface is the embodiment of the instructional strategy in WBI, and that interface design must be integrated with the traditional instructional design process to ensure the overall effectiveness of the instruction. It is no wonder then that instructional designers who are looking for guidance on good site design, page design, and multimedia for WBI are turning to publicly available Web design guidelines.

There are both advantages and problems with existing sets of Web design guidelines (Boling, Bechelmeyer, Squire & Kirkley, 1997). For instance, many of these guidelines were derived from user-centered design approaches, and consequently they are connected to particular models of user motivations and tasks. A popular book, *Designing Web Usability* (Nielsen, 2000), focuses on informational and commercial Web sites where the user is a "customer", and the main task is to find information quickly and to obtain a needed service or product. Nielsen describes the importance of Web site designs that will create customer satisfaction, because in a competitive Web environment, users may easily go elsewhere with one click of the mouse. A sample of Nielsen's guidelines and the user goals they support are shown here:

- Web pages must support user-controlled navigation (so that users can freely shop for information and products.)
- The pages must have a concise writing style with very short pages with secondary information relegated to supporting pages (for readers who frequently scan text.)
- Important information must pop out immediately on the page (so that users can quickly find what they need.)
- Multimedia is used to direct attention to important information and impress readers (so that they will remain at the site.)

Knowing the purpose of the Web-based system that is being designed is critical when selecting existing sets of guidelines to aid Web site design. Some user-centered guidelines may be inappropriate for some instructional purposes. Without a careful examination of the models and assumptions underlying the guidelines, inappropriate guidelines for an instructional Web site may be selected, and the misuse of guidelines may be perpetuated. The guidelines that are selected by the instructional developer should support the instructional goals of the instructional Web site. But, relating instructional goals to site design is more of an art than a science, and some designers are better than other. Design guidelines that are based on research and best practices can be a useful aid for designers at all levels of experience.

Comparison of Instructional Web Sites to Informational Web Sites

Users of an instructional Web site may be "customers," but they are more importantly "learners." Romiszowski (1993) proposes that components of an instructional system differ from an information dissemination system. The design of instructional systems focuses more on the evaluation of learner performance and feedback than on simply providing information. In contrast, information system design focuses more on content, and how it is organized, structured and presented. While the goals of all Web sites may be customer satisfaction and task efficiency, the overarching goal of an instructional site is to provide an environment for optimal learning. But, guidelines that support the important goals of learner satisfaction and effective and efficient learning are not easy to extract from the existing sets of Web design guidelines.

Human Factors Guidelines for Effective Learning

Several categories of Web design guidelines are specifically useful for the design of instructional Web sites. These include: 1) site structure guidelines (to improve navigation and understanding of content organization), 2) page design guidelines (to improve readability, comprehension, and aesthetic appeal), and 3) multimedia guidelines (to support relevance and comprehension). In each of these categories, guidelines can be prioritized in terms of the purposes and goals of an instructional Web site.

Web Site Structure

The structure of a Web site refers to the sequencing of pages and relationships between pages that create the physical setup of the site. Guidelines for structuring a Web site are especially helpful when the proposed Web site will contain a large number of pages and when the structure is complex. Several types of Web site structures have been described in guidelines (Lynch & Horton, 1999; Rosenfeld & Morville, 1998), along with discussions of the advantages and disadvantages of each. These structures focus on commercial and institutional Web sites, but their models can be used to analyze instructional Web sites. Although there are many different kinds of Web site structures, there are three structures that are most likely to be used at instructional sites: linear, hierarchical, and web structure.

Linear structure. The linear structure allows the learner to move only forward or backward through the site. Thus, the learner's freedom of movement within the site is strictly controlled and severely restricted. While there may be hyperlinks to external Web sites or to links to internal pages, such as a glossary, there is no freedom to deviate from the instructional developer's plan. Completion of a unit of instruction is required to progress to the next unit. Linear structure simplifies site design, giving the designer complete control of the instructional sequence.

Hierarchical structure. This structure starts with a home page that allows branching to other instructional units (e.g., lessons and modules). Units are usually chosen from a menu, and often the instructional units may be chosen in any order from a table of contents. Learners have more control over the sequence of instruction within a hierarchical site structure because they can choose the major topics. But, subtopics are usually accessed in a linear fashion.

Web structure. This structure provides an almost unlimited number of paths through the site. However, there is no formal page hierarchy and pages may or may not be interconnected. Learners may like the freedom to browse and explore, but the disadvantage is that they may not understand the site's underlying structure, and can become lost or disoriented. This structure may be good for highly experienced learners seeking higher levels of knowledge, such as understanding complex principles (Golas, 2000).

When designing a complex Web site having a hierarchical or web structure, the interface for navigation is an important related design issue. Many sets of existing guidelines suggest the use of navigational aids, such as image maps, highlighted links, history lists, and the use of titles and subtitles. This will prevent confusion when navigating a complex site. Each navigational aid, however, should be examined in light of the learner's purpose in navigating the site. If the purpose is browsing to find a specific item, then the learner will require an interface that supports a set of exploratory and scanning activities appropriate for surveying a large amount of information without going into too much detail. If the purpose is to learn the information presented on the site, some navigational aids may be more appropriate than others. For instance, in an empirical study cognitive performance on a study task improved when an extended history list showed the user past navigational choices. Unfortunately, efficiency dropped because users spent more time on the task than they would have without the history list (Guttormsen, Schar, Schluep, Schierz, & Krueger, 2000). Regardless of the purpose of the Web site, many general human factors principles undoubtedly apply to both commercial and instructional Web sites. Good site design can prevent learner frustration with navigation by eliminating "dead-ends," inappropriate feedback, or navigational elements that are not obvious.

Page Design

The design of a Web page includes the layout of text and graphics on the screen, typography, and writing style. The Yale *Web Style Manual* suggests that important information on a page should be placed on a diagonal axis with the most important going from left to right and top to bottom to support quick exploration and scanning of text (Lynch & Horton, 1999). Good page design for instructional Web sites should serve slightly different purposes than a commercial Web site. The page design should 1) focus the learner's attention on important information to increase comprehension and memory, and 2) create an aesthetically pleasing environment for learning. Simple page layouts with good balance and proportion, and without too many irrelevant graphics, will serve these purposes. Regardless of what learning activities are guiding page design, design should minimize eyestrain caused by glare, busy backgrounds, and long textual line lengths.

Instructional designers must ask themselves if learners would prefer to have printed pages of instruction or prefer to read them on the screen. Page design becomes more complicated when both printed versions and screen versions of instruction are both required. Screen printing tasks also involve interactions with the computer that do not directly involve instruction, yet they have the potential to affect the instructional process if these tasks become too burdensome for the learner.

Media

Instructional designers are becoming more interested in multimedia to supplement text and graphical instruction. But, this is more often driven by the capability to use technology rather than educational research and theory (Park & Hannafin, 1993). When considering audio, video, or animation in the design of WBI, the primary purpose of the media should be to enhance learning and retention. Other purposes are to direct attention of the user to important information or to enhance user enjoyment of the site, but these may be of lower priority in WBI. Media should not be used if it distracts the learner from the instructional tasks or when it increases time to complete the tasks (e.g., waiting for downloads).

Animation. Animation has a variety of uses, including showing dynamic changes or illustrating change over time. Animation and 3-D graphics create new visualizations and support more natural interactions with the computer. They can enhance learning if they support perceptual and cognitive processes that are critical to the learning task (Hamel & Ryan-Jones, 1997). Motion or action used primarily to enhance the realism of the presentation does not appear to have a significant effect on learning (Anglin, Towers, & Levie, 1996).

Video. Just as with animation, video will improve instruction when it is important to show movement or a sequence of actions, such as a procedural task (Wetzel, Radtke, and Stern, 1994). There are several reasons why it is better to try to accomplish the same effect with still graphics and text or voice narration: it is more cost effective, will be more accessible to learners who have less than adequate computer display systems, and will decrease learner wait time.

Audio. Audio provides an input modality that is separate from the visual display. Speech output used to provide narration is not very effective when it is simply redundant to text presented on the screen. But, speech output has been shown to greatly enhance learning when it is used to explain complex diagrams or animations that require learners to concentrate on the visuals. Textual explanations require the learner to scan between the visual display and the text, and thus reduce attention to the visual display (Kalyuga, Chandler, & Sweller, 2000; Mayer & Moreno, 2000). Audio is more effective if learners have control of audio output, such as volume, and replay.

Conclusions

Although publicly available guidelines for Web design are plentiful, they may be at odds with instructional goals as well as research findings. It is important for an instructional designer to carefully examine the original purpose for a set of guidelines as well as support for their pedagogical correctness. In an example provided by Danielson, Lockee & Burton (2000), human interface design guidelines often suggest pull down menus for data entry, rather than text input because text commands must be committed to memory and are subject to spelling errors. But if the instructional goal requires that students memorize the textual inputs because they are terms and definitions that are required learning, than the command input is preferred over menus. Guidelines can aid a designer in improving the quality of instruction, but they can also degrade the quality of instruction if they are inappropriate or incorrect for the instructional goals of a Web site.

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Biographical Sketches

Cheryl J. Hamel, Ph.D. is a Senior Research Associate at the Institute for Simulation and Training, University of Central Florida, and Adjunct Professor, UCF Department of Psychology. Dr. Hamel is a researcher and consultant in Advanced Distributed Learning, and has a number of publications and presentations related to computer-based training and Web-based instruction. She holds a doctoral degree in experimental psychology and additional degrees in psychology and mathematics.

Address: 3280 Progress Drive
Orlando, FL 32817
E-mail: chamel@ist.ucf.edu
Phone: (407) 882-1375
Fax: (407) 658-5059

David Ryan-Jones, Ph.D. is a Senior Research Psychologist at the Naval Air Warfare Center Training Systems Division in Orlando, FL, and is working with the Joint Advanced Distributed Learning Co-Laboratory of the Department of Defense. He received his Ph.D. in Experimental Psychology from Florida State University in 1988. He has been an Adjunct Faculty member at the University of Central Florida and Seminole Community College. His research interests are in application of distributed learning technology to military and civilian education and training.

Address: 12350 Research Parkway
Orlando, FL 32826-3275
E-mail: ryan-jonesd@navair.navy.mil
Phone: (407) 380-4311
Fax: (407) 381-8877

Multidimensional Course Development and Delivery: A University Credit Accounting Series for the Internal Revenue Service

Carole Hayes, Coordinator
External Relations and Development
Office for Distributed and Distance Learning
Florida State University

The Office for Distributed and Distance Learning (ODDL) was established as a separate entity within the Florida State University in July of 1999. The purpose of ODDL is to support faculty in their use of technology in teaching and learning to serve students both on and off campus. This support takes the form of projects to develop complete degree programs as well as workshops to help individual faculty members develop either web-based components for their residential classes or full distance learning courses for either on- or off-campus delivery. Within ODDL the Digital Media Production Group (DMPG) and Online Learning Support Services (OLSS) provide ongoing assistance to faculty as they develop and teach their courses.

Florida State University has a statewide mission and has met that mission by offering courses and degree programs around the state at many off-campus sites. ODDL has assisted in development of programs in computer science, information studies, software engineering, and interdisciplinary social science as upper-division majors offered online for baccalaureate degree completion for students with an AA from a Florida community college or its equivalent as assessed by FSU Admissions staff. These computer accessible, Internet-based undergraduate programs are available to qualified students anywhere in the state of Florida or elsewhere.

The key to successful technologically mediated teaching and learning either on campus or at a distance is student support. ODDL, with the cooperation of many offices on campus, has developed an online orientation for distance students. Distance students are able to do everything online that is necessary to matriculate at FSU, from application and registration to checking grades and getting transcripts.

The technological support is coupled with human support in the form of course mentors in the degree completion programs, technical support through help desks, and academic coordinators who work closely with both distance students and participating academic departments to solve any academic, administrative, or technical problems they may encounter.

IRS University Consortium

IRS Commissioner Charles Rossotti has led over 2,000 IRS employees over the past few years in redesigning the agency through their work in "modernization" teams. The entire organizational culture has been examined and redesign efforts are being implemented. Among these efforts is e-learning. The IRS is working with several institutions of higher learning, thus comprising the IRS University Consortium, to ensure that employees have the requisite training and skills to perform their jobs within the modernized IRS. With the consultation of Arthur D. Little, Inc. several institutions were chosen to participate in the consortium.

Two divisions of the IRS, Wages & Investments and Small Business & Self Employed, were reorganized resulting in the introduction of new positions. Current and future employees who would fill these positions must have the equivalent of from 6-12 hours of basic and intermediate accounting. For current employees moving into these positions, not only is the coursework required but also it must be completed within one year from upgrade to the new positions.

The Florida State University was already successfully offering online courses and the course development and implementation strategies and supports were deemed appropriate for the thousands of IRS employees needing formal credit accounting courses. Four courses, Basic Accounting I & II and Intermediate Accounting I & II were identified for development and delivery by FSU. The Florida Community College at Jacksonville is offering one of these courses, Intermediate Accounting II, at this time. FSU has established partnerships with Florida community colleges to serve Florida's postsecondary students as well as for special contract courseware delivery, such as for the IRS University Consortium and the U.S. Navy. FSU agreed to develop and deliver courses during fall 2000. Delivery was required by May 2001.

The Pilot Course: Learning Authentic Lessons

The timeline for development and delivery was very short. Therefore, it was determined that a pilot course should precede full-blown delivery so that unanticipated challenges could be addressed. During January 2001, 91 IRS employees were admitted, oriented, and enrolled in Basic Accounting I. The short story is that 77% of students completed the pilot and 79% were successful in meeting the IRS standard for passing the course.

Cultural Interface: The Academy Response to Federal Agency Needs

The complete story is much more complex. Systemic differences, philosophical differences, IT differences, but a common goal of educating students presented challenges from which we have all learned a great deal.

Communication and Connectivity

The courses that have been developed for asynchronous participation by FSU require minimum equipment specifications, ISP connectivity, and computer literacy. This is all clearly expressed to inquiring students, who may then decide if this is the right learning environment and if they have the basic access and skills to successfully participate. The IRS employees, however, are required to complete these courses. That is, a choice has been made for them, albeit a professionally and personally enhancing choice. The IRS is a very closed and secure system in terms of technology because it is charged with tasks involving highly confidential materials and information. Employees may not enter any more explicit information than their names on any web enabled form. Therefore, FSU's readiness for *online* inquiries, *online* submission of applications, *online* enrollment and *online* application for the FSUCard (key to email accounts and course accessibility) were, essentially, useless. From the student support perspective, never were these online, scalable processes more appropriate than for students scattered all over the United States. As we learned, many students either did not have or did not know their email address. Many students were not accustomed to using an Internet browser. Many did not have basic computer literacy skills, i.e., facility with word processing, email and file attachment, and Internet browsing. The communications network among IRS staff is more telephone or face to face (F2F) than is the online culture of the university. The result is that students and their managers are not automatically connected via email. Email and bulletin boards are basic to online asynchronous learning, not just for course participation, but also for communications leading up to admission and enrollment. ODDL staff solved these problems, to the degree that the university could compensate, by creative and extensive use of staff time. Hard copy applications were routed to ODDL. Staff examined forms for completeness, verified email addresses, input minimal data for departmental use, and then sent the forms on to Admissions. ODDL staff used the information gleaned from applications to set up email accounts and secure login and passwords for each IRS employee/student. The biggest challenge was lead-time. The culture issue of deadlines for admission, enrollment, obtaining course materials, was large and has resulted in firmer, earlier deadlines for receipt of information. While this is a compliance requirement for the IRS, it is an aid to ensuring that students are enrolled and that they have all necessary access to begin and successfully engage in their course work. A constant tension exists between doing the business of the university and responding to the needs of the IRS student population. The fact is that when a university becomes a subcontractor, there is a client relationship to nurture. However, students also have responsibilities as members of an academic community. Negotiation and communication among administrators is well established at this point and involves at least one audio conference per week that includes IRS administration, A.D. Little staff, and FSU/ODDL staff.

Logistics and Assumptions

Most of the IRS employee/students are 45 years of age or older and most have not attended school, secondary or postsecondary, for decades. So, the superimposition of student role on the employees has been challenging. While IRS has been diligent in identifying high quality instruction, the student support needs for online learning just began unfolding during the pilot. Many students do not have access to a computer with Internet connectivity on a regular basis; many can access computers only in very busy work areas adjacent to coworkers. The actual allocation of time during the day and access to a computer is uneven. Local challenges were found to be numerous and constituted both a morale issue and barrier to participation. FSU's courses are developed to focus on the online component for course announcements, syllabi, communications, and homework submission. In other words, the bulk of the learning environment is supported online.

As most large organizations, the IRS is hierarchically structured as well as being spread all over the entire country. To communicate with students, it is necessary to communicate with, and sometimes through, their managers. For the 91 students who were enrolled during the pilot there were a total of 59 managers. For the purposes of taking exams, there were 59 (most of whom were managers) proctors identified to whom tests and instructions for their secure administration were sent. The layers of communication add to the time necessary for conveyance of information and requests as well as having an impact on the accuracy of messages and information provided in response. For example, student support personnel at FSU assumed that the IRS employees who were to be students were well informed about that fact and that they knew how to go about initiating participation. This was not so. Not all managers or students were informed as fully as necessary. FSU staff learned, quickly, where there were communications gaps and worked quickly to resolve them all the while developing strategies, along with the IRS, to prevent problems in future terms.

Pedagogy

Dr. Jane Reimers, KPMG Professor of Accounting and tenured FSU faculty member was tapped for course design. Dr. Reimers has successfully used the Internet for course development and delivery. She actually implemented online asynchronous activities and communications to add value to large lecture classes in basic and intermediate accounting. Student interactions, course completions, and student satisfaction as reported on end-of-term evaluations all increased dramatically with this innovation. She had just completed writing a textbook on financial accounting and was recognized to be the perfect content expert to guide development of a totally online series of accounting courses. Dr. Reimers, besides being a content expert, is recognized for her superior teaching abilities. She is extremely student centered in her teaching philosophy and practice. While the responsibility for the content and curriculum of the courses are with Dr. Reimers, she is and has been assisted by instructional design specialists, web developers and media experts in actual production of courseware, both online and in CD-ROMs. One of the benefits of course development using a course management system, like Blackboard, is that it is highly revisable. Dr. Reimers was able to respond to the needs of this particular student population by being alert to their needs and by using the properties of Blackboard to make mid course adjustments as necessary. Many of the issues facing her students involved lack of familiarity and practice with online tools and an online communications environment. Dr. Reimers, with ODDL support, developed orientational CD-ROMs for both the Basic Accounting I course and as a general introduction to online learning in the Blackboard environment especially for IRS students. A student guide for online learning accompanies each course. Following the pilot, several changes were made in the guide in response to the needs of the learners in this particular population.

Student Support

As mentioned earlier, FSU has implemented several student support mechanisms through ODDL. One of these is the system of mentors. Mentors support all online degree completion courses (also called 2+2 Distance Learning Initiative since students are eligible only if they have completed lower division courses or the AA). Mentors are chosen by faculty for their content area expertise and then are trained by ODDL staff in online support of students. FSU has employed the mentor model since fall 1999. Overall, student retention is about 87% and success defined as a grade of C- or higher is around 85%. In a telephone survey of 44 students who had just completed mentor supported courses, there were 66 responses that referred to mentors. 91% of these were positive comments and emphasized the encouragement and clarification that a mentor provides in a new environment. The unfamiliarity of the course delivery system along with the anxiety of participating in a college course are both mitigated by the safety net provided by the mentor system. Six mentors supported students in the IRS basic accounting pilot course. This summer, three courses are being offered by FSU. There are 594 students enrolled, 33 mentors employed, 4 support faculty and 4 full-time faculty. The 594 students report to 283 managers and have tests distributed to 266 proctors.

Student Performance and Evaluation

Fifty-five percent of students who completed earned grades of C- or better; 24% received an A. Students identified the mentor as their first point of contact and frequently mentioned the availability of mentors and of Dr. Reimers when they needed a question answered. Students became familiar with email and with the use of the Forum or threaded discussion feature of the course management system. Via this communication capability and through others, students became peer resources and enriched their learning experience by sharing information and life experience with fellow students. A questionnaire was administered by FSU on a web-based form to the pilot participants. The questionnaire was anonymous and contained 24 items. The response rate was 56%. Responses were collected in a database and downloaded into an Excel spreadsheet. Two of the 24 items were free responses and were captured in Word. The IRS along with their subcontractor, PTG International, Inc. is revising the instrument that was used to include other items in a Level 1 evaluation. Overall, the students expressed satisfaction with the course after their initial struggles to master a new environment and a college credit course. In fact, in F2F interaction with several students who had completed the pilot course, this writer was told about the experience of frustration and fear of the unfamiliar and how this turned to a rewarding and enriching process of mastering an unfamiliar mode of interaction and successfully completing a required accounting course.

Reflections: A Productive Relationship

The IRS is to be commended for undertaking such a broad scale educational program for employees. Also, IRS administrators have listened to employees and acknowledged observations and suggestions from FSU staff. A manual was generated by the IRS for managers to help them understand the initiative and how best to support their supervisees without undermining morale or productivity. Technology upgrades and accessibility are a priority in support of employee development and modernization. FSU as a 150-year-old institution of higher learning has captured many lessons about responding to customers without jeopardizing the integrity of courseware, testing, accreditation compliance, faculty freedom, or student confidentiality. Within FSU, tensions were generated among staffs of different departments because of the demands of serving such a large population of non-traditional students. In fact, while ODDL was developed and has been working to serve non-traditional students, it might be said that the IRS population is comprised of *non-traditional* non-traditional students. Not only are they all at a distance, but also they are members of one group and must be treated both individually AND collectively.

Not surprisingly, the communications protocols and capture of necessary information to communicate efficiently were not fully understood by either entity. A great deal was learned by the experience of reflecting on the *assumptions* made by both cultures as we sought strategies to solve and/or prevent problems encountered during the pilot. The university culture is accustomed to being responsive to students who have chosen to seek degrees or enroll in course work. The IRS has needs and expectations for on-demand training and credit delivery in the workplace. We have all learned a great deal and will continue to do so. As we work together, hundreds and eventually, thousands, of IRS employees will successfully participate in and complete college credit courses that will enhance their careers and their personal lives.

Biographical Sketch

Carole Hayes is the Coordinator of External Relations and Development and has worked with the Office for Distributed and Distance Learning since August 1998. Her career background and formal education are in the fields of adult education, evaluation, and distributed learning.

Address: Office for Distributed and Distance Learning
University Center Building C, Suite 3500
Florida State University
Tallahassee, FL 32306-2550
E-mail: chayes@oddl.fsu.edu
Phone: (850) 644-4114

Measuring Information Bandwidth in Online Instruction

Hoyet H. Hemphill, Ph.D.
Program Director of Research
North Central Regional Educational Laboratory

Online instruction courses are being increasingly offered by higher education institutions and private vendors. How do we assess the quality of courses? One way is determine the amount of useful information that is provided by the course; and how much of this information is useful and engages the learner. This session will present a technique for assessing the amount of information conveyed during an online course, and the proportion of that information that is useful.

Instructional Syntax Analysis

Interactivity is one of the measures of how effective instruction is (Sims, 1997). For decades, there has been concern over how interactive computer-based instruction and computer-based models are as delivery systems for content. Most of this attention has focused on the delivery system itself, how interactive the technology is. Recently, there has been a shift to how the instruction interacts with the learner (Schwier, 1992). Jonassen (1988) identified five levels of interactivity for computer-based training based on the learner's response modality, the task, the level of cognitive processing, the type of software, and the level of artificial intelligence in the design.

Instructional syntax analysis is a useful tool to demonstrate and analyze the interaction and communication between the computer instructional system and the computer user. The Shannon-Weaver communication model serves as a guide for the model of instructional syntax. This approach has been used for the analysis of interaction in computer-based instruction (Hemphill, 2000).

Instructional syntax analysis involves an analysis of the potential interaction between the learner and a learning system, based on the structure of the course. This requires that the type of potential interaction is accessed and recorded. However, the actual interaction of the learner with the learning systems (the discourse) nor the relevance and meaning (semantics) of the content is evaluated for the instructional syntax. Basically, the analysis asks:

What is the learning system telling the learner?

And,

What is the learning system asking the learner to do?

Analysis of Online Instruction

For online courses, interactivity can be rated on the complementary scales of immersion and reciprocity. Immersion focuses on how involved the user is in the experience and what response is expected on the part of the user. A 10-point scale is used to determine:

- What action has the user taken?
- Is the action a simple response or complex response?
- How immersed is the user, has she/he lost the sense of self and entered into a state of flow?
- How has the system responded to the user's action?
- What system change occurs as a result of the user's action?

- Is the response of the system reactive or proactive?
- Does the system make the user feel like he/she is collaborating with a responsive entity?

The scale measures are:

Immersion Scale

0 = Non-Response
User has nothing to respond to
1 = Receptive
User just views, reads, listens
2 = Status Request
User asks for simple status request
3 = Simple Navigation
Action to move within current view
4 = View Modification
Action to shift view in plane, time, etc.
5 = Single Parameter Change
User changes single parameter, enters value
6 = Multiple Parameter Change
User simultaneously changes parameters
7 = Static Exploration
User performs interactive modifications
8 = Dynamic Exploration
User interacts with dynamic system
9 = Collaboration/Invention
Interacting with someone (avatar/agent)

Reciprocity is the flip side of immersion and assesses what the system does in response to the user. It is related to the concept of feedback. Different types of feedback are most effective for different types of learning (Clark and Dwyer, 1998). It uses a 10-point scale to determine:

- How has the system responded to the user's action?
- What system change occurs as a result of the user's action?
- Is the response of the system reactive or proactive?
- Does the system make the user feel like he/she is collaborating with a responsive entity?

The scale measures are:

Reciprocity Scale

0 = Non-Response
Information not specific to content
1 = Receptive
System displays content information
2 = Status Request
System displays model status
3 = Simple Navigation
Pixel relocation
4 = View Modification
New view generation

5 = Single Parameter Change
One parameter updates/system re-display
6 = Multiple Parameter Change
State changes
7 = Static Exploration
Near real-time update
8 = Dynamic Exploration
Anticipatory changes based on user response
9 = Collaboration/Invention
Models human agent or is other human

Together, the interplay of immersion and reciprocity maintain the level of interest and motivation through a balance of challenge and the learner's level of knowledge and skills. This creates a sense of "flow" for the learner (Csikszentmihalyi & Csikszentmihalyi, 1988).

Information Bandwidth

On-Line Learning can also be assessed through channel width, channel depth, and channel saturation. Channel width is number of elements contained on the Web page in an online course. Each element can be thought of as a mini-portal containing information, a graphic, or a link or other reactive object.

Channel Depth is the sum of the level of depth for each element on a Web page. Each element is rated for cognitive depth on a 10-point scale.

Saturation is the proportion of total possible depth compared to the actual depth. Each element is rated for cognitive depth on a 10-point scale. The actual depth sum is divided by the maximum sum if all elements were rated as 10. This ratio give an measure of channel saturation.

Together, these three measures can be used to determine the interactivity in an online learning course. You can plot changes in channel width and saturation over time to determine if you are dealing with education or entertainment/advertising and to determine if there is cognitive overload.

For example, a course that has many elements, but little depth, would have a low saturation. Two courses could have the same saturation levels, but one course might have a much channel width. This course could cause cognitive overload for learners.

Pacing within a course might also be an issue. The saturation and width might start low and then increase as the course continues. Later on, channel depth might go up, while channel width might decrease.
There might also be a correlation between the channel width or saturation, and the immersion or reciprocity level of the Web page. Pacing might be a third factor that would interact with page interactivity and channel bandwidth.

The use of instructional syntax analysis with online course may shed light on what makes some courses more effective than others. It may also provide guidelines for the pacing of online courses.

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Biographical Sketch

Dr. Hoyet H. Hemphill is Director of Research for Technology at the North Central Regional Educational Laboratory. He has been an educational researcher and instructional designer for public education, higher education, and private industry.

Address: Suite 200
1120 E. Diehl Rd.
Naperville, IL 60563
E-mail: hoyet.hemphill@ncrel.org
Phone: (630) 724-1208

Blending Online Strategies Into Traditional Staff Development Training

Dusti Howell, Assistant Professor
Instructional Design and Technology
Emporia State University

Bill Stinson, Professor
The Teachers College
Emporia State University

There have been numerous concerns raised by the public on the quality of teaching in our schools. Political and professional factions have developed outcomes and standards for assessing not only student learning but also teaching performance. A variety of professional approaches are being explored and proposed to enhance our K-12 educational systems. One example is the California Formative Assessment and Support System for Teachers (CFASST) which emphasizes the point of investing in teacher development and sustained examination of teaching performance over time will increase success for students and teachers alike (Oliebe, 1999). Another example, the National Commission on Teaching & America's Future's 1996 report, "What Matters Most: Teaching and America's Future," outlines several changes in professional development programs. One change proposed is to organize teacher education and professional development around standards for students and teachers. Another suggestion is developing teacher academies, partnerships of schools/universities, and learning networks transcending school boundaries.

"An Ambitious Vision of Professional Development for Teachers," an NASSP Bulletin, mentions that quality teacher professional development has never been more important with the ever, increasing intensity of challenges and expectations for quality education (Ganser, 2000). Increasing teacher effectiveness and student achievement will require teachers to learn not only new skills and perspectives but also unlearn practices and beliefs that they have held onto (Darling-Hammond and McLaughlin, 1996). Guskey and Sparks (1996) use the terms – content, process, and context – as guidelines for creating quality professional development. The content of a professional development offering should deepen one's understanding not only of an academic discipline, but teaching and learning principles. The process reflects how these professional development experiences are planned, organized, and implemented. Corcoran (1995) suggests that when teachers are more actively engaged in well designed, intellectually intensive, socio-emotional interactions, a more effective professional development experience will be gained. The quality of context emphasizes providing an inservice environment for improving teaching through such things as accessibility to resources, meeting individual and organizational needs, and learning activities that are experiential in nature.

Professional development should reflect the skills needed for successful participation in society. Technology continues to play an ever increasing role in driving much of our cultural environment. Teachers must understand the implications of our existing technological society and be able to use its tools in a variety of ways to demonstrate its usefulness in teaching and learning situations. One reason computers have not met our expectations of their usage in education is because teachers are not trained on how to integrate this technology into their instruction (Schofield, 1995). Caverly, Peterson, and Mandeville (1997) describe a "generational model for professional development," in which we must not just "train" teachers in technology but "educate" then to think differently about how to use it in their classrooms. A special eSchool News report, "Professional Development: Bringing Technology into the Classroom Effectively," states that teachers are already using computers regularly at home and at school for lesson planning, correspondence, and personal business. Yet the vast majority of teachers are not using computers in their classrooms for instructional purposes (Levin-Epstein, 2000).

We need to insure that teachers are exposed to the most recent technological advances and tools for learning. "In the teaching profession, teachers are constantly seeking ways to network with other educators. Sharing lesson plans and instructional strategies can be of great value to all educators… Consequently, many successful online classes develop community." (Landeck, 2000). When teachers are actively involved in using and applying technological tools in various learning situations, the possibilities of using technology in one's own classroom is enhanced. The following examples of online staff development outline how various technological tools are being used to deliver onsite versions of traditional professional development programs.

Technological Applications in Virtual Staff Development

Due to the ever increasing complexity of technological tools, one application is to involve several entities in the development of effective hybrid, virtual staff development programs. Using collaborative partners has far-reaching potentials in converting a traditional face-to-face training program into an online experience. Our staff development endeavor utilized university faculty, school district personnel and corporate partners. This conversion of a traditional training program into a virtual experience created several technical necessities. First, written and audiovisual materials developed by Aboutlearning, Inc. needed to be converted into an Internet and CD-ROM delivery system. Another necessity dealt with the interactive nature of this training program. It necessitated providing cooperative learning and student interactive experiences, to preserve the integrity of Aboutlearning's program which is based upon brain research and learning style behaviors. It was decided to focus on several interactive vehicles for this online course: e-mail, threaded forum discussions, and live chat. In addition, one major component of the training required lesson plan assistance and evaluation opportunities. Students developed and critiqued each other's final projects–a lesson plan comprising various learning styles, including left and right brain activities. To initiate this, students brainstormed in class forums to create their lessons. Lesson plans were exchanged and critiqued via e-mail with other students. This process was facilitated through a separate website (http://www.lessonbank.com/), developed to allow students a structured area to post and evaluate lesson plans. Final lesson plan postings were available at this site for class review. This site became a repository of hundreds of lesson plans available to both students and trainers. Collaboration of various partners was a necessity in providing such a quality program.

Another technological application has been developing hybrid models which integrate onsite and online experiences into a single professional development package. Each one of these vehicles contributes in its own way to a more effective and efficient training situations. For example, online technologies allow professionals to participate in training anytime or anyplace. Also they eliminate the need for extensive travel and time away from one's classroom. The online approach is a very effective vehicle in providing advanced information for upcoming topics and addressing information which can not be covered due to the time constraints of a real time session. Onsite classes allow teachers the opportunity to engage in face-to-face discussions which may help create a more cooperative and unified atmosphere. An onsite component tends to diminish various feelings of isolation connected with solitary computer usage. Also, face-to-face opportunities enable students to spontaneously ask for clarification of information, class assignments and class procedures. The collaboration of both online and onsite techniques can encourage a more refreshing approach to professional staff development in utilizing technological advances as well as the consideration of learning style differences in designing a professional development offering. One such hybrid offering was providing an intermediate level curriculum training program to middle school teachers. The school seminar was used for face-to-face presentation and discussion of materials. This onsite experience was blended with a distance learning format for advanced information of topics, more in depth forum discussions due to seminar time constraints and team communications in lesson building. The traditional training would have taken the group of teachers away from their classrooms for four consecutive days.

Finally, simulated virtual experiences are now being presented to teachers as a means to demonstrate how online instruction can be developed and incorporated in the educational setting. This simulation allows for opportunities to showcase various technological tools to help generate new ideas and approaches for dispensing information to students. In addition, this type of virtual delivery enables teachers to critique and interact with innovative and technologically based instructional designs. In the past, Aboutlearning, Inc. provided trainer recertification in a five day, week long training in various national geographical locations. Travel was necessary for most educators wishing to be certified as trainers. Recently a trainer recertification training was conducted online, not only to reacquaint professionals with new advances in the training model but to critique various new strategies in presenting this information. Fifty-two professionals representing twenty states were involved in this training. Diversity was cited as a real plus in discussing and evaluating these new materials. Also, professionals received discounted tuitions due to not having to contract and send trainers to a remote site, as well as eliminating overhead costs for such items as facilities, other related workshop expenses. This type of approach to reviewing training materials and new research has great potential.

On the Horizon

The virtual online course can address and retain the integrity of the staff development training if the technological tools are appropriate and implemented properly. Online delivery systems can offer attractive educational and economical options to school inservice formats. It's important that the collaboration of various professionals be encouraged to create a better professional development experience. Hybrid options need to be explored where onsite-online combinations can be structured to fit individual school schedules, to resolve critical need areas within the educational framework, and to alleviate administrative decisions involving teacher time away from the classroom. As Landeck (2000, p.42) states, "To meet the different learning styles and levels of tech expertise of their staff, many educational institutions are looking at a combination of online and face-to-face instruction."

The time has come to consider online experiences as a viable option in professional development not only to train teachers but to generate new frontiers in more effective learning and training opportunities. Today's technological tools can be incorporated into providing relevant, topical inservice training for teachers. This will not only insure effective and economical delivery methods in enhancing academic and pedagogical knowledges but showcase the uses of various technological tools in enriching the learning experiences of students.

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Biographical Sketches

Dusti Howell is an associate professor in the Instructional Design and Technology Department at Emporia State University. He has taught at every grade level from 1st through graduate school. After graduating from the University of Wisconsin at Madison with focuses in both educational technology and educational psychology, he taught in Beijing, China at the high school level. Most recently he has created and taught courses for the online master's degree program in Instructional Design at Emporia State as well as developing high tech study skills workshops.

Address: 1200 Commercial Box 4037
Emporia, Kansas, 66801
E-mail: howelldu@emporia.edu
URL: http://www.solida.net/portfolio/
Phone: (620) 341-5082
Fax: (620) 341-5785

Bill Stinson is a professor in the Teachers College at Emporia State University. He is a co-developer of a complete online accredited Master's program in Physical Education for teachers. He has presented at such technology conferences as ASCD, SITE, and EDUCAUSE. He has collaborated with public schools and private corporations in developing online instruction.

Address: 1200 Commercial Box 4013
Emporia, Kansas, 66801
E-mail: stinsonb@emporia.edu
URL: http://www.emporia.edu/hper/index.htm
Phone: (620) 341-5934
Fax: (620) 341-6400

Writing for the Web

Les Howles
Senior Instructional Design Consultant
University of Wisconsin–Madison

Diana Howles
Online Learning Manager
CUNA Mutual Group, Madison, Wisconsin

Often the assumption is made that strategies and techniques used by writers of traditional print media also apply to writing for the web. This is not entirely true. Marshall McLuhan once observed that: "the medium is the massage." New communication media impose new ground rules and structures onto their content. The web is a new communication medium. Writing for this medium requires new strategies and techniques that differ from traditional modes of print.

This article provides practical guidelines and techniques on writing effectively for the web. We look closely at usability research regarding how users approach and read online documents. We then offer tips and practical advice from experts in the fields of web writing and online documentation. Our aim is to help you adjust your writing strategies to make your web documents more readable and enjoyable for your web site users.

How Users Read on the Web

It behooves us to better understand how users of web pages approach the task of reading text online. When addressing the question "How do users read on the web?" Jacob Nielsen often replies "They don't." Users don't read web pages as they would a research paper or novel. Numerous usability studies by Nielson and others provide insights regarding how users tend to read web pages. The following pattern consistently emerges from these studies:

1. **Scan pages**: Users look at main titles, headings, menu labels, and headlines to gather a general sense of the site content and determine whether to spend time there.
2. **Skim content:** Users selectively search or browse for interesting material or information they want and ignore the rest.
3. **Read and retrieve:** Users start reading only after they've located the information that interests them. If documents are more than a few pages in length, most users will print them rather than read online.
4. **Leave:** Users move on quickly after locating the information they want. If the site contains interesting information, they may bookmark it for future use.

Our usability tests at the University of Wisconsin have confirmed the above pattern. We are often shocked at how students cavalierly skip over text material we regard as critical. On the other hand, if we were to monitor our own reading behavior on the web, we would likely notice similar tendencies. In reality, most people visit web sites to obtain answers to questions and find specific information. Websites typically are not places where people spend lengthy periods of time reading text as if it were a book. A "good" site is one where readers can scan and skip around to find the information they need quickly and easily.

The web is a highly interactive and user-driven medium. Therefore, in order to convey content material most effectively, web writers should keep user needs, preferences, and reading strategies at the forefront of their design. Let's now address some practical tips and strategies for effective web writing.

Become User Centered in Your Writing Approach

One common frustration for web users is the inability to find desired information within a website. Often the information is buried in a sea of words beneath an attractive home page. Ironically, this problem can stem from the use of writing strategies learned in school. Most content experts begin the writing process by outlining the topics and information they believe to be most important. Consequently, many web sites are organized around the mental schemas of their authors; that is, how the writer thinks about and represents the content. Sites designed in this manner are content-centric.

The most profound change web writers can make is to shift from a content-centric orientation to a user-centered orientation. On the web users are king and queen. Web writers might serve their readers better if they first focused on FAQ's and used this as the basis for their content outlines. A good exercise in establishing a user-focused orientation involves discussing a content outline of your web site with several potential users. Listen closely to the questions these people have about your content material, then incorporate the user's perspective to the content in the site's design. Being rigorously user-focused from the outset—as you outline your content material—is the first, and probably most fundamental change you can make to improve your web writing.

Use Top Level Summaries or Advanced Organizers

Another frustrating experience for online readers is sifting though a lengthy text document only to discover it does not contain the information they wanted or expected. One way to prevent this frustration is to incorporate top-level summaries at the beginning of a web document. These are often referred to as advanced organizers.

Advanced organizers provide a synopsis or quick overview for a body of ensuing text and perform several useful functions. First, they provide information about the contents of the document. This enables the reader to decide whether the document contains the information he/she needs. Second, the pedagogical benefits of advanced organizers has been well established in the field of educational psychology. As an orientation aid, they contribute to improved comprehension, retention, and learning. Another type of advanced organizer is the "quick scroll." The quick scroll often appears as an introductory bullet list of key topics at the top of the page. Clicking on a topic within the bullet list provides a quick link to the corresponding content of the page.

Chunk Text Into Smaller Units With Labels

Novels and transcripts illustrate the concept of a flat text structure. However, flat text is anathema to web readers. Because flat text is visually undifferentiated, scanning and skimming yields little information about the contents of the document. Consequently, a reader must invest considerable time and effort to gain a general understanding of what's in the document.

In contrast to flat text is the structured writing method developed by Robert Horn. Structured writing abandons many conventions of traditional academic writing. A key principle involves dividing a body of text into smaller chunks of related information. Chunking involves grouping information into small manageable units and labeling each chunk with a descriptive label. A chunk or block of text is equivalent to a paragraph. Structured writing facilitates - and almost invites - visual scanning. Readers gain substantial clues as to the content and structure of a document prior to reading it. Furthermore, chunking and labeling makes the underlying structure of the document explicit. Horn's research has shown that this writing method significantly increases comprehension, retention, and readability. Though somewhat barebones in style, the structured writing paradigm is probably one of the most practical models currently available for constructing user-oriented web documents.

The chunking principle also can be applied at the document level. Breaking long documents down into shorter pages with clear titles helps readers avoid excessive scrolling. A logical place to break long pages occurs when the topic shifts significantly. For lengthy multiple page documents, ensure that a link to a print-friendly version is available.

Invert the Writing Pyramid

An academic research writing style is not recommended for most web writing. Nielsen adds "One of the occupational hazards of getting a Ph.D. is a distinct predilection for the traditional pyramid style of exposition." The pyramid style of writing generally begins with a problem analysis, background information, and research review. One then methodically works their way toward a conclusion and summary. Although this writing style works well for publishing in research journals, it does not work as well for most web sites. Nielsen proposes an inverted pyramid writing style commonly used by journalists. The inverted pyramid style begins with the summary and conclusions. Hyperlinks are included in the document so users can access details such as background information at their own discretion.

Make It Concise

Content experts often struggle to write succinctly. One common recommendation for converting print documents to the web is to reduce word count by up to 50%. This may seem daunting, and perhaps impossible, but is usually doable and appreciated by web readers. For example, usability studies clearly demonstrate the benefits of concision. Web sites that undergo ruthless editing and follow the principles covered in this article result in faster task time, less errors, increased recall and retention, and higher degrees of user satisfaction. In fact, Nielsen has claimed usability increases up to 124% when concision and other factors are incorporated. Web writers need to be constantly vigilant to eliminate unnecessary words and tangential details. Expert web writers also recommend shorter sentence and paragraph structures. Limiting sentence length to less than 25 words and paragraphs to no more than 9 sentences can be helpful. Additionally, writing in an active voice makes sentences more compact.

Use Bullets and Tables

Bullets and tables make text documents more concise and scannable. Bullets eliminate the need to construct awkward transition phrases between sentences. For example, an entire paragraph of text often can be converted into a single stem sentence followed by five or six bullet phrases. Numeric lists also can help delineate actions or steps comprising a procedure.

Often tables are used as matrices for representing quantitative information. However, an entire page of text can often be reframed and compacted into a single table. These tables can be used for classifying concepts or describing procedures. For example, a simple three column action table labeled "What to do," "How to do it," and "Expected results" could replace an entire page of text, yet provide a more explicit and meaningful representation of the content.

Organize Page Layout so It's Easier for the Eyes

Several principles can be applied to the visual design and layout of web pages for easier reading. Keep in mind that reading from a computer screen is different than reading from a paper document. Many studies report that reading speed and comprehension are reduced by at least 20% on computer screens. Tightly spaced text on a computer is hard on the eyes. A consideration for page layout is to leverage white space around text. For example, enlarging margins and narrowing the width of text lines aids eye tracking across the page. Clearly, white space provides more than just an aesthetic or psychological function. Used properly, the space can facilitate smoother eye movements across the screen.

Conclusion

Writing effectively for the web challenges many of our traditional writing paradigms. Application of these key principles will not only enhance your web page design, but provide your readers with a more meaningful and successful online experience.

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Biographical Sketches

Les Howles is a senior consultant for the Department Academic Technology Solutions at the University of Wisconsin – Madison. Les has served as an instructional design and technology consultant at UW-Madison for eight years. He has over 17 years experience in the fields of instructional design, media production and educational technology. He has worked in various medical, corporate, government and academic settings developing training programs, multimedia applications and on-line learning materials. Les has given numerous workshops and seminars related to instructional design and the development of effective web-based instruction.

Diana Howles is an Online Learning Manager in Corporate Learning for CUNA Mutual Group in Madison Wisconsin. She currently is leading the design and development of the CUNA Mutual's corporate learning portal and user interface. She is also responsible for teaching others to effectively use synchronous internet communication technology for teaching and learning. Diana is a certified Achieveglobal trainer. Training topics include technical systems, leadership training, customer service, telephone skills, executive presentations, and communication. In her spare time Diana enjoys public speaking engagements, voiceover narrations, theater and film.

E-learning at General Electric Medical Systems: A Blended Approach

Glenn C. Hoyle Ph.D.
Project Manager, Compuware Corporation

Brian J. Adams
Senior Instructional Designer

Kirk Robertson
Lead Project Integrator

The effective use of E-learning has become a major focus of many corporations. General Electric, under the leadership of Jack Welch, has taken the lead in mandating the use of "E-everything" for the purpose of improving efficiencies and reducing costs.

The "e-ification" of General Electric Corporation, was the result of a management mandate. GE is a leading practitioner in seeking to realize the promise of cost savings through the transformation of many of its process into an "E" format. This has taken the form of everything from "E" days—in which most printers and fax machines are disabled, to the creation of extensive intranets, to the migration of in-residence based training programs to an e-learning or "blended" design and delivery approach.

This session details the procedures employed by GE Medical Systems (GEMS) http://www.gemedicalsystems.com/, and Compuware Corporation in producing two major E-learning courses resulting in:

- Direct cost savings of $6,000 per student
- Learning improvement gains ranging from 28-30%
- Reduction of study time from 120 hours of in-residence instruction to an average of 36 hours, for a time compression of 68-70%.

The Signa MR LX and Open Speed courses are targeted at GE Service Engineers who have the responsibility to maintain and repair Magnetic Resonance Imaging (MRI) equipment under contract with GE. The courses have been redesigned with the goal of reducing classroom training time and travel costs, while maintaining or improving the quality of instruction and improving instructional consistency.

In August, 2000, GE Medical Systems (GEMS) contracted the Milwaukee branch of Compuware Corporation, (www.compuware.com) to design, produce and test, 2 major e-learning courses for Magnetic Resonance Systems (MR/i machines) to be delivered as part of a blended curriculum including OJT and in-residence components.

Working from a task analysis, a team of Compuware writers, web designers, and Instructional Designers created and released 2 complete E-learning courses consisting of more than 22 modules, 83 lessons and 350 topics. A combined test bank of more than 1,000 objective items was also developed and tested.

Courses were designed to be modular, scalable and maintainable. By developing the course in HTML the course were delivered over the Web, and burned to a CD. The course functions equally well on a CD as over the Web with the only exception that some links to web resources do not work if the student is not on-line with the GEMs Intranet..

The initial task analysis was developed by consultants with WIDS http://www.wids.org (a division of the Wisconsin Technical College System Foundation) and was created using the WIDs task analysis software.

Following the initial design and verification of course modules, lessons and topices, the courses entered production. Courses were developed for Web delivery in HTML and Javascript, using Dreamweaver v3, and Coursebuilder. Hi Help Index was used as the indexing software.

All course content was organized according to the initial task analysis. Content was keyed to, and balanced, to accurately teach the competencies. Effort, of course, was made to present information attractively, as well as in small "chunks." Following each topic, students had the opportunity to answer self-assessment questions. These questions gave feedback to the correct answer, and comprised a mix of True/False, Multiple Choice, Drag and Drop, Free form entry, and Explore Area features built into Coursebuilding.

Of special note is the attention given to Beta Testing the E-learning products to quantify the effectiveness of the courses.

The goals of the beta testing process were to:

1. Refine, through on-site student participation and testing, the overall accuracy, usability and quality of the E-learning program.
2. Define, measure and document the validity and reliability of the test bank.
3. Identify other areas of improvement and maintenance beyond the scope of this project.

Measurable questions included:

1. How will learning—as measured by a written test - improve as a result of the Learning Modules?
2. What amount of time savings will occur as a result of the E-Learning?
3. How will students perceive the quality, effectiveness, and usability of the E-learning course? Student's emotions, perceptions and attitudes toward a learning event affect learning, and confidence in the training.

In addition to the quantitative measures identified above, we also collected feedback and anecdotal information from participants. Special attention was given to ensuring that course content was presented clearly and accurately for all participants and especially non-international participants.

Since there were no prior course exams, benchmarks, or baseline of learning performance, the measurement metrics developed for this Beta established a new precedent.

After the courses were produced, the testing components were transferred into GE's internal course registration and testing system, TEDS. TEDS is a people resource system. More information can be found on their web site. (http://www.teds.com/) The beta testing attempted to validate the content, accuracy and validity of the e-learning courses. Both courses were extensively reviewed by GEMs Subject Matter Experts and administrative staff.

For these courses, the beta testing was taken a major step further. We had the opportunity to observe a pre-test three groups of users, who were in-residence at GEMs education center in Waukesha, Wisconsin.

The participants in the Beta testing group comprised of 31 GE Field Engineers who were originally scheduled to participate in a 3 week in-residence class beginning January 2001.
Students represented widely differing levels of technical knowledge, prior experience with MR, and slightly more than 50% were from countries other than the United States. Overall, 10 countries were represented in the Beta testing group.

The results which were developed and benchmarked included:

Metric:	How Measured:	Goal:	Actual Result:
Cognitive Skills Acquisition	Objective Test	25% improvement in testing scores	28-30% improvement in testing scores.
Behavioral Change	Observation of Student Performance from a listing of core competencies.	80% of students able to perform competency tasks, to an 80% level.	All students were able to perform tasks identified at the 80% level.
Time on Learning Task	Course Timings	Completion of 15 modules in 60 hours	Average completion in 36 hours.
Reliability and Validity of test items	Item Analysis, examination of answers in an Excel Spreadsheet.	Elimination or revision of all questions demonstrated to be invalid or unreliable	Tests were revised based upon student feedback

Summary

The dramatic results achieved in cognitive skills, learning time, and cost reduction again demonstrate what distance educators have been asserting for many years. Well designed e-learning and distance learning courses can be just as effective, if not more so, than education delivered in a traditional milieu.

Student's reactions to the e-learning experience was generally positive. The ability of students to go through an e-learning course first, before they were exposed to the MR equipment provided to be a positive experience.

Overall, the cost-savings and efficiency results realized in these two courses, continue to validate GE's decision to continue developing e-learning courses.

The next step in validating, implementing and improving e-learning courses for GEMS might include follow-up studies to determine long term learning gains from E-learning courses. Other areas of study might include the continuing use of e-learning courses for reference and as refresher information. Finally, GEMS may wish to consider, as they did this these two courses, tying all it's e-learning courses to overall competency standards benchmarked by job position and expert performance.

Biographical Sketches

Glenn C. Hoyle, Ph.D. (http://www.hoyle.com) is a project manager with Compuware Corporation who specializes in E-Learning and Distance learning program. Dr. Hoyle's experience includes more than 20 years experience in instructional design and program development. Glenn was the learning architect and the lead instructional designer for the MR LX E-learning course.

Address:
E-mail: ghoyle@hoyle.com

Kirk Robertson is a senior instructional designer with more than 10 years experience in developing CBT, graphics, video and multi-media productions for such organizations as Kemper Insurance, Compuware and GE Medical Systems. Kirk was the lead instructional designer for the MR Open Speed and MFO projects.

Address:
E-mail: kirk.Robertson@compuware.com

Brian J. Adams is the Lead Project Integrator for the Signa MR LX and Open Speed training at Lead Project Integrator internationally renowned education center in Pewaukee, WI. Brian combines 12 years of classroom instruction, and 8 years as a technology instructor at the College of Lake County in Grayslake, Illinois.

Address:
E-mail: Brian.Adams@med.ge.com

Instructional Quality in Distance Education: A Support Staff Perspective

Mary Hricko
Library Director
Kent State University Geauga

Shelley Marshall
Network Systems Administrator
Kent State University Geauga

Shelley Urchek-Geist
Faculty Secretary
Kent State University Geauga

Instructional quality in distance education is crucial to the success of any distributed learning program. Most of the research in improving instructional quality offers a wide range of "lessons learned" case studies, but few, if any are presented from the perspective of the support staff. If the goal of an institution's distance education program is to provide the same level of support as that which is offered to students in the traditional learning environment; then it is crucial to pay special attention to support in technical, academic, and student services.

The role of the support staff in the implementation of a distance education program is important throughout the entire process of design, development, and delivery of a course. Research indicates that student support is crucial for retention. Morgan and Tam (1999) found that institutional and epistemological barriers provided the greatest number of reasons for why students withdrew from their distance education courses. Support services also assists with accreditation. The *Distance Education Handbook* of the Accrediting Commission for Community and Junior Colleges (ACCJC) (2001) recommends, "enrolled students have reasonable and adequate access to the range of student services appropriate to support their learning and assess their progress." Finally, funding for distance education often depends upon evaluations generated by both faculty and students participating in the programs. Programs with inadequate support will yield negative reviews. In turn, the failure of administrators and educators to address the value of support services in distance education programming may prove to be a costly mistake.

First Steps

The primary areas of support that must be addressed in ensuring the instructional quality of a distance education program include; technical support, academic services, and student services. In each of these areas, there are specific issues to consider in the design, development, and delivery of a distributed learning course. As educators select the best format (videoconferencing, computer-mediated, or web-based) to present the material of their course, they need to determine the role in which support services will function in their course. All too often this aspect of course preparation is overlooked. Yet, in order for support staff to meet the needs of remote access students, communication is a must. In distance education there are several types of critical two-way communication or interactions that must occur:

1. Educators and students
2. Educators and remote sites
3. Sites to sites
4. Educators and support staff

Although most educators address the first three types of critical communication, many fail to consider the importance of communicating with support staff. It is usually not until a problem arises that any interaction occurs.

Even if communication is established, it is still very important that those involved in the process of implementing a distributed learning course be aware of the facilities at the remote sites. It is imperative that educators know what resources are available at the remote sites prior to design, development, and delivery of a course. Instructors should never assume that all sites are equal. Ideally instructors should make efforts to visit remote sites, but realistically, continuous updates regarding the facilities of the remote sites, the contacts at the sites, and the remote sites protocol should be given to all instructors prior to their participation in distributed learning.

Technical Support

Technical support is perhaps the most important element in the coordination of an effective distance education program. According to ACCJC (2001) "Planning for technology enhanced facilities and equipment appropriate to meeting program or course objectives must be part of long range planning and budgeting activities." Educators should be well trained on all of the equipment to be used in their course. Understanding the limitations of the medium chosen as well as the potential difficulties that may arise will prepare instructors for "technical breakdowns" which may occur. It is also highly recommended that instructors conduct a trial run of their instructional session prior to the actual date of the presentation. Waiting until the actual class session to find out that slides are not easy to read on a screen can lead to a frustrating situation.

Ideally there should be a technician at each site, but instructors are ultimately responsible for reporting technical difficulties to the support staff. Relying upon a designated student to report problems with audio or video is not often a reliable means of addressing the matter. Students are not always knowledgeable about the equipment or software and may not be able to explain what is wrong. Although students should be informed of proper procedures of reporting technical problems, it is more important to teach them "technical etiquette." Students should be educated on what not to fix, i.e. equipment they should not touch. Asking inexperienced students at the remote sites to adjust equipment may do more harm than good.

In addition to equipment, instructors should not use software programs that they themselves have not learned. It is not the responsibility of technical staff to teach students how to use specialized software. Educators should know whom to contact if the specialized software is not working properly. All too often technicians are asked to determine what is wrong with software they have had no formal training in using. In addition, it is important that educators inform technical staff of the software to be loaded for the course. All issues regarding site licenses, copyright controls, and software distribution must be coordinated well before the start of the course. It is not feasible to assume that the technical staff can load software in the middle of the semester the day on which the software is needed.

Educators should find out well in advance of their course whether the remote sites could meet the specific technical needs of that course. What are the lab facilities? Are computers easily accessible in a videoconferencing room? What applications are available? Where do students have access to the Internet? How many outlets are in the distributed learning classroom? What technologies are available at the remote site? What do the students know about using these technologies? All instructors should take time to review these issues and also provide the minimum software and hardware requirements to students involved in asynchronous learning environments. Students unfamiliar with the distributed learning environment should also be given an orientation that ensures proper training in using the technology. This practice is especially important for courses presented in web-based formats where students may be working independently.

Academic Services

Academic support addresses tutoring assistance, library usage, and services for students with disabilities. It is important to know the names of the individuals who coordinate these services at the remote sites to provide students with this information. It is also valuable to know the policies and procedures regarding the use of these services. Every remote site can be different. These contacts can provide useful information regarding the types of academic services available to remote students.

To assist the academic support staff, it is important that instructors provide hard copies of all course materials, particularly assignments and tests. Materials sent to the tutoring center will better assist staff in helping students with their coursework. Course syllabi distributed to the library will better inform the library staff of upcoming research projects. The library can then provide more effective electronic reference to remote students. Course materials given to the office of disability services prior to the run of a course can be adapted for students with special needs that may enroll in the course. Hard copies of all course documents, including those available of the web should be sent to the remote site library to be placed on reserves for times when students are unable to attend class or gain access to the course web site.

Educators who wish to supplement their instruction with resources housed at the remote sites should ship such materials with detailed instructions regarding the distribution, use, and return of these items. It is the responsibility of the instructor to verify the availability of library resources and multimedia equipment at each remote site. Asking students to write summaries from journals they cannot access at the remote sites is not always easily resolved through interlibrary loan. Instructors must also be aware of copyright issues regarding the creation of "article" course packets distributed to remote access students.

Educators should never assume that students know how to use the library's web-based resources. Hence, it is recommended that all distributed learning courses include a session in bibliographic instruction. According to Roger Krentz (1999), "the more information libraries are able to provide electronically, the more equality of access distance learners have, and the more academically rigorous and competitive distance education programs can become."

In addition to the requirements of the library, instructors must adhere to ADA rules and regulations in the design, development, and delivery of their course. It is in the best interest of all educators to develop web documents that adhere to standards of universal design. Educators should make certain that course materials could be modified for students with special needs. It is also helpful that instructors have a basic understanding of adaptive technology. There are a number of web sites and resources that provide information on these topics.

Student Services

Student services include class management, distribution of course materials, and testing. All sites should receive a detailed syllabus that includes contact information, class policies, and procedures for technical difficulties. Complete and timely information on changes in the curriculum must be sent to all of the remote sites to make accommodations for students affected by class adjustments. Telling students that the next session is cancelled does not relay the information to the support staff assigned to course delivery. Instructors should always have a contingency plan for days in which technical malfunctions prevent the delivery of the course. These plans include procedures for making up the class session, information regarding where course notes can be obtained, and also, access to a taping of the class, where appropriate.

It is important for educators to plan for all aspects of course material distribution including returning student homework, papers, tests, and other materials that will be going between sites. Copies of all of these materials should be given to each remote site well in advance of the date to be distributed. Educators may want to consider developing a "packet" of information to be given to each student at the beginning of the course. Procedures regarding the distribution of course materials should be well established to ensure that students receive and send class documents in an effective manner. Educators may want to consider providing self-addressed envelopes to the remote sites for return of homework, tests, projects, papers or related student communication.

Test dates should be established and communicated to each site. Changes in test dates, times, or materials need to be formally communicated so that proctors can be prepared. Educators should provide clear written policies and procedures for testing, class activities, and student behavior. Although instructors have the ultimate responsibility of disciplining their students, it is very important that all sites handle student disruption, suspected academic dishonesty or conduct issues in a consistent manner. Educators should inform students about classroom etiquette at the beginning of the class. Students should also be given information regarding office hours. Hara and Kling (2000) found that "the lack of prompt feedback from the instructor was certainly a major source of frustration for students . . ." According to McIssac and Gunawardena (1996), "the concept of interaction [including feedback] is fundamental to the effectiveness of distance education program as well as traditional ones". Students at remote sites require more frequent feedback and communications must be timely.

Conclusion

Administrators and educators must demonstrate a commitment to support staff involvement with the design, development, and delivery of distributed learning. Funding and training for support staff must be included in the budget plans for distance education. Additional research on the role of support staff in distributed learning must also be done to evaluate the effectiveness of distance education programs. Such research is crucial for student retention and accreditation as well as the overall quality of instruction.

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Biographical Sketches

Mary Hricko is an Assistant Professor, Library & Media Services. She serves as the Library Director at Kent State University Geauga Campus and is the regional campus library liaison for distance education.

Shelley Marshall serves as the Network Systems Administrator at the Kent State University Geauga Campus. She coordinates all technical and student support services for distance education at the campus.

Shelley Urchek-Geist serves as the Faculty Secretary for the Kent State University Geauga Campus. She is responsible for coordinating all office operations and faculty support.

Addresses: Kent State University Geauga
1411 Claridon-Troy Road
Burton, OH 44021
Phone: (440) 834-4287
Fax: (440) 834-0919

The Night *Chicago* Died: Visual and Verbal Communication Standards in Online Learning

Marrit Ingman
Lead Editor
The University of Texas at Austin

Debra L. Winegarten
Instructional Designer

With a world of online course development tools at our disposal, instructional designers have more power to create robust virtual learning environments than ever before. New technologies offer comprehensive and easily implemented solutions for enriching the look, feel, and quality of a distance student's learning experience and expediting the process of course development. Institutions that build courses "from scratch" or with commercial platforms (such as WebCT) can easily integrate the desired combination of streaming video and audio, animation, interactive content, graphics, and community-building features.
Gone are the days of the inert printed study guide, pored over with pencils before being committed to the VeloBinder and stacked in the mail room. Curriculum development teams communicate with version notes, change tracking, and audio annotation, not Post-Its™ and proofreader's symbols. And student feedback is prompt, encouraging swift revision when a hyperlink breaks or an instructor's question is opaquely worded.

Despite the potentially timesaving, streamlining features of these enhancements, production teams often find themselves struggling to keep order. For the sake of editorial and readability standards, some team members may secretly long for the return of sticky notes and handmade marginalia, of a more complex but orderly development process that often stamps out more errors than the direct-to-Web process. And even designers who are comfortable with electronic course authoring tools may find themselves stymied by the gap between Stone Age style guides and Iron Age software. Personnel who participate less directly in electronic course development must communicate effectively with those who do, such as programmers, contract developers, student assistants and interns, and graphic artists.

When faced with these challenges—along with the inevitable deadline crunch—can a design team maintain a consistent editorial and visual style? In the interest of promoting discussion about this question, we are pleased to share some of our experiences in re-purposing our institution's high school curriculum for online enrollment.

Background

The Distance Education Center, a division of Continuing & Extended Education at the University of Texas at Austin, has offered asynchronous print-based courses for ninety-one years and enrolls approximately 24,000 students per year. Due to the size of our program and success of our print and blended-technology courses, many faculty and staff seem to prefer the demonstrated success of an offline course model, with its clearly defined personnel roles and set-in-stone standards. However, after successfully piloting an online course for college students, we embarked upon a months-long project to launch our complete high school curriculum (forty-five courses) by Fall 2001.

Our Staff

Our work group ordinarily comprises two full-time instructional designers, one half-time instructional designer, two full-time editors, a faculty liaison, and a production coordinator. For the duration of this project, we hired a number of contract designers, programmers, and proofreaders, recruiting from the University's graduate program in instructional technology and from the local pool of high-tech talent. We also work collaboratively with the information technology staff of the Distance Education Center, a group which includes three database programmers and a Webmaster, all of whom were instrumental in this project, but none of whom work exclusively on curriculum development.

All of these personnel brought different priorities, backgrounds, skill sets, and personalities into the mix. Some contract designers possessed more technical than instructional expertise; one was a certified Macromedia trainer, another a programmer with a background in system security. Others possessed more graphic art and Web experience; several operated consulting and site design businesses. Of our contract editors, one possessed a background in mass-market print journalism; another was a technical editor with expertise in science writing.

The Production Process

After the workload was divided among the contract designers, our first priority was establishing a set of presentation standards that would guarantee a consistent look and feel for the courses. Since most of our contractors would be working independently, using other campus facilities or their personal workspaces, we wanted to ensure that our standards and expectations were clearly articulated. To this end, we generated a Multimedia Addendum to our in-house style sheet.

To take maximum advantage of our group's expertise, we utilized a consensus model, receiving input from our design experts for advice about the elements of our course interface (preferred typefaces, a Web-safe color palette, ADA standards, etc.), from our technology staff for advice about system requirements and logistics, and so on. From our editorial staff, we sought advice about how content from our text-only study guides should be revised, re-organized, or otherwise re-purposed for online learners.

To speed the production process, we developed two sets of templates, one for each of the applications used to create our online course content—Macromedia Dreamweaver 4 and Director 8.0. Our Dreamweaver template contained a set of standard subheadings, table settings, and other page elements, set up as a cascading style sheet. Our Director templates, created by our contract programmer, could be used to create matching, fill-in-the-blank, short-answer, flash card, multiple-choice, picture labeling, and crossword activities, as well as games of "concentration" and a fully interactive lesson in analyzing a literary passage, including audio files recorded by the designer. Finally, our graphics specialist developed a set of standard buttons for navigation within the interactive lesson content created with Director.

Content Problems and Solutions

We were not surprised to discover that our collaborative work process required constant compromise and communication. Like any long-range, ambitious project, it also yielded some unforeseen but interesting results, delights and disappointments alike. Specifically, we were sometimes faced with the challenge of maintaining our stated editorial standards: age-appropriate and inclusive language; engagement of multiple learning styles; appropriate and fairly used graphic content; readability and liveliness; and correct mechanics and grammar.

We discovered that many of our multimedia specialists were accustomed to a sort of "Web design" style of syntax and capitalization, influenced by, for example, the titling conventions typical of high-tech businesses ("amazon.com"), uniform resource locators, and file extensions. We edited many sentences set entirely in lowercase type ("please play again."), often lacking end punctuation. We also attempted to establish a convention for the naming and labeling of buttons and icons, using the headline style ("Show Your Answers") indicated in section 7.127 of *The Chicago Manual of Style* (pp. 282–283), but we were not entirely successful. A tendency toward "whispering" with stylized lowercase type or "shouting" with all-caps emerged.

We struggled at times to keep verb tenses consistent. Often, we negotiated between our contractors (many of whom were young international students with English as a second language) and the idiomatic English written by our course authors (certified and often veteran public school teachers from districts of various size in greater Austin, Texas). And in keeping with our program's "no barriers" mission and broad demographics, we strove to eliminate cultural and gender bias, replacing it with inclusive language. While much of this problem could be attributed to the age of our program (particularly in regard to the rapidly changing world of distance education), we encountered new instances, as well. In one of the more egregious "sins of omission," a contract designer failed to include any women in an assessment covering the background reading for a lesson on Medieval literature, despite the presence of notable female figures (such as Eleanor of Aquitane) in the reading assignment.

We also attempted to preemptively eradicate the irritating term "website" from our course materials, replacing it with the preferred "Web site." The latter construction is indicated by The University of Chicago Press, Merriam-Webster, *PC Magazine,* and well-known grammar curmudgeon Bill Walsh, a copy editor at *The Washington Post* and administrator of TheSlot.com, a Web site for editorial professionals. Subsequently, we gained a reputation around the office for being inflexible and Babbity.

Our results were also mixed with regard to the look and feel of the multimedia developed by our contract team. Our style sheet indicated a standard palette of eight Web-safe colors to be used in creating screen elements in Director, but we were often surprised by how the color palette was used (such as striped backgrounds and blue-on-black text screens). One Director activity for a health course was engaging and effective, but it also contained a graphic that made us flinch and cover up: a pair of outsized scissors indicating "sterilization" as a non-reversible method of contraception. While we hesitated to quash the creative impulses of the contract designers we had recruited, we had to draw the line at times.

Finally, we began to assemble the text and multimedia elements of our course content. At this stage, we needed agreement between our editors and our authors with regard to the organization and presentation of lesson text on the Web. Some of the lessons in our print study guides, especially for courses not recently updated, contained a profusion of essay-style verbiage. We sought to replace this presentation with a Web-friendly, "chunked" text style, using more subheaders, shorter paragraphs, and graphic organizers, such as ordered lists. While this decision was based upon well-established guidelines for ease of use and navigability for online reading (see "Ease of Use Guidelines," published by IBM, or Crawford Kilian's excellent "Effective Web Writing," published in *Web Techniques,* February 2001), the process of implementing it required flexibility and was at times challenging. The DEC is blessed with access to seasoned faculty at both the high school and college levels. Austin is home to both a premier research university (with a wealth of tenured and widely published faculty) and the Texas Education Agency, the governing body that establishes the state's curriculum and oversees its public school districts. Yet we might, for example, find it difficult to translate the inspired (and multitudinous) words of a professor emeritus used to lecturing at will into bullet points, marquee text, and "back to top" links. We devoted a significant amount of energy to massaging our lesson commentary into a Web-friendly format that would retain the intellectual integrity and personal flavor of the author's original remarks.

Our Technology and Its Limitations

As we re-purposed our lesson content, we were impressed by the rich virtual learning environments our team could produce for our students—yet we were also struck by the limitations of these applications and their programming. Specifically, to keep our editorial standards consistent between the print and online courses, we were required to establish numerous workarounds for text formatting in our Dreamweaver and Director templates. Our needs often outstripped the capabilities of these applications, which were not designed with the robust formatting features of page layout and word processing software.

For example, we could not use raw HTML code or our cascading style sheets to create hanging indents that would display uniformly in multiple browser environments. Since we were unwilling to require the use of one particular browser or accept a discrepancy in appearance, we were forced to place bibliographic elements and other hanging-indented items in HTML tables, a practice that, while necessary, proved somewhat challenging to course designers learning Dreamweaver on the fly.

Likewise, we found that certain text styles, such as small capitals, were impossible to create in Director. Furthermore, our templates imposed certain limitations. Due to a randomizer function added by our programmer, we were not initially able, for instance, to apply basic and at times plainly necessary text formatting, such as italics, to the selections in one column of a template used for matching exercises.
It was also challenging at times to explain these limitations to the various team members affected by them. Our programmers, quite understandably, didn't foresee the need for full-featured text formatting; our course designers didn't foresee limitations in text formatting that might necessitate the rewriting of questions, nor limitations in screen space that might curtail the length of their questions or feedback.

Conclusion

While this process represents a major leap forward for our program and the students it serves, we feel it was immeasurably instructive to all of us, as well. During this process, each group in our team learned much about the others' needs, and we were able to work together to create timely and effective solutions to the problems we encountered. Our editors and course designers learned valuable new skills, and our template programmer was inspired to develop an application that would expand Director's formatting capabilities. (After a round of manual testing on our literary analysis template, he also expressed interest in taking one of our literature courses to further his understanding of poetry.) We are delighted that we have created opportunities for discovery and growth among our team and among our students.
Above all, we are pleased to have approached these challenges with an eye on our future and an eye on our past. Inasmuch as we are eager to continue discovering new ways in which to serve our students and the cause of distance learning in general, we have not forsaken quality for technology; we have sought to marry the two. We hope to continue to communicate effectively with lifelong learners of all backgrounds, maintaining our commitment to precise, inclusive, and engaging instructional communication—whatever changes may arise in the media of communication.

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Biographical Sketches

Marrit Ingman is the lead editor for curriculum at the Distance Education Center, a division of Continuing & Extended Education, The University of Texas at Austin. She works closely with the instructional design team and has contributed extensively to the DEC's courses in English language and literature. She has taught English composition to adult learners at Springfield College and also enjoys a freelance writing and editing career. Her work has appeared in a variety of publications, and she is a regular contributor to *The Austin Chronicle* and *Savoy*.

Address: Distance Education Center
Continuing & Extended Education
The University of Texas at Austin
P.O. Box 7700, Austin, TX 78713
E-mail: marrit.ingman@dec.utexas.edu
Phone: (512) 471-6233
Fax: (512) 471-7853

Debra L. Winegarten is an instructional designer and author. She was the instructional designer for the UT-Austin Distance Education Center's high school courses, specializing in constructing online activities. She is the author of the recently released *Katherine Stinson: The Flying Schoolgirl*, and co-author of *Strong Family Ties: The Tiny Hawkins Story*. Her next book *Mum's the Word*, will be released in August 2001, and she is under contract for two more books.

Address: 603 South Third Street
Austin, Texas 78704
E-mail: sociosight@aol.com
URL: www.sociosights.com
Phone: (512) 326-5051

Narrative Culture in a New Context:
Constructing Collaboration with ICT in Teacher Education

Solveig Jakobsdottir, Associate Professor
Kennaraháskóli Íslands/KHÍ
(Iceland University of Education)

Thuridur Johannsdottir, Educational Technology Adviser
Kennaraháskóli Íslands/KHÍ
(Iceland University of Education)

The process of technology integration in the Icelandic educational system during the last decade started with the development of a strong "grass-root" together with the 1992 creation of the Icelandic Educational Network which connected most Icelandic schools to the Internet in the early 90's (Ísmennt, 1999). But innovative uses of the Internet were slow to spread (Jakobsdóttir, in press). However, early prominent examples probably influenced government and policy makers so that in 1996 a national policy (Ministry of Education, Science, and Culture) was created that called for effective use of information and communication technology (ICT) at all levels of schooling. And in the spring of 1999 (Ministry of Education, Science, and Culture) new national curriculum guide for elementary and secondary schools was published based on the policy. In 1997 an ICT-related policy was also drafted at Iceland's main teacher education institution, Iceland University of Education (KHÍ) (Kristjánsdóttir et al., 1996).

KHÍ currently has about 1500 students. The B.Ed. program is both run on-campus and Net-based, the latter one started in 1993. Also, about 93% of over 250 graduate students are distance learners. Most of the staff members teach both on campus and at a distance, using largely e-mail in the latter case as vehicle for teaching and learning. However, data collected in 1999, among students and staff at KHÍ (Jakobsdóttir & Jóhannsdóttir, 2000), as part of a European funded research project, indicated that other kinds of technology uses in teacher education (on campus and in distance education) were still minimal although innovative practices within the university existed. The question was how to increase and spread use of technology to enhance teaching and learning within KHÍ. The final part of the research project (by teacher education institution in the UK, Iceland, Italy, and Portugal) was to explore professional development of teachers and their integration of ICT in education through case studies and interviews. The Icelandic team decided to adopt an action research model for the study with an additional goal to make successful experiences more visible and promote ICT within KHÍ through concrete examples and sharing of experiences. This paper describes that part of the project and some of our main findings.

Background

Michael Fullan (1999) has studied change processes in institutions and emphasizes the importance of good "inside" collaboration which should have the following characteristics: Fostering diversity while trust-building, provoking anxiety and containing it, engaging in knowledge creation (tacit to explicit, explicit to explicit), combining connectedness with openendedness, and fusing the spiritual, political and intellectual.

Ned Kock (1999) has also emphasized the importance of collaboration and studied the impact of collaborative technologies on knowledge management in institutions. His ideas reflect an interest to use the technology to improve communication where stress is laid on discourse and that all voices are heard – also the sceptical ones. Different views are not only legitimate - they are the treasure of an institution (Kock). The intention is that multiculturalism may flourish inside and outside the institutions.

We were inspired by these ideas and by theories where the spirit of social constructivism (Murphy, 1997) is clearly in the background. Accordingly, we look at knowledge as a social construction and view the context in building meaningful knowledge as very important. Therefore, we wanted to base our methods of technology integration on the existing culture in our country and within our institution.

Icelandic culture builds on an old heritage of sagas. The Norwegian settlers brought with them the nordic mythology in form of oral stories in the 9th century and Icelanders kept them alive by storytelling until Icelandic writers wrote them down in the 12th - 14th century along with the famous Icelandic sagas. We are proud of this heritage and still enjoy good narratives and storytelling. Recent international research on language developement show that Icelanders are strong story-tellers and writing reflexive text whereas they are relatively weak in writing expository texts in comparison to other nationalities (Berman & Verhoeven, in press). Narrative culture is also strong within our institution at KHÍ and we enjoy many good story-tellers both in social and professional activities.

By taking advantage of the strength of storytelling in the Icelandic culture we tried with this study to meet people where they were on familiar and safe ground. We wanted to bring in new ideas and new technologies – but at the same time respect an old tradition.

Method

Participants and Design

Thirty four teacher educators at KHI (about one third of the total number of the teaching staff) were identified by departments heads and peers as practitioners of various types of ICT in their teaching and invited to participate in the study. As one of the goal was to promote ICT within KHÍ through concrete examples and sharing of experiences action research model was adopted for the study.

Instruments

Our main instrument was a "Story gathering" form (Frontpage data gathering sheet online, gathering data into an Access database with automatic publishing). See http://soljak.khi.is/utreynslakhi (in Icelandic) and http://soljak.khi.is/ictteachered (in English). On the form people were asked to: Describe successful ICT-related practices and methods, and the technology they used; what had been the benefits for students to adopt this kind of practice; what kind of influence this kind of practice had on other work, the subject(s) taught, or co-workers; what problems came up and how they were dealt with; and what was needed in terms of equipment, skills, technology background/experience for this practice to work. The stories were published automatically on the same web, categorized by subject and could be changed or deleted by the author.

Procedure

Participants were contacted by e-mail and then by phone or personal contact and asked to provide a "story" of what they felt had been a successful practice in using ICT in their teaching or other type of work. Furthermore, participants were invited to be interviewed and/or be led through the on-line data gathering materials through file sharing in Netmeeting. The story would be published automatically when sent in and be used later by the researchers to provide concrete examples of use to the rest of the university community. People were told that stories might also be translated to be used internationally. Stories (21) were submitted by 19 out of the 34 chosen staff members (56% of those invited to submit stories), and in addition the two researchers also submitted three stories (so 24 stories were submitted from about 20% of the teaching staff).

Data Analysis

Stories were first classified within the framework of possibilities for the use of ICT, and then specifically within the framework of net-based DE (information access, communication, and web-based publishing). Examples of interesting practices were translated into English.

Results

About 80% of the stories collected concerned distance education, e.g. the use of web-based learning environment created with special editors such as Learningspace (8) and WebCT (1) and Internet-based communications (6). The interpretation of the narratives was a part of the action research process used to promote different types of practices. Below are some examples:

Access to information

On the Internet we have a huge amount of information that can be of great use for students in different subjects at all levels of education. Given this circumstances it becomes inevitably one of the main objectivs for schools and teachers to teach their students to evaluate and make use of material they can access on the Internet. A teacher at KHI who also teaches at primary school level said:

> Lilja Jónsdóttir, assistant professor, instructional methods: *I look at the Internet as an important addition to other resources which my students can use, both at the primary school level and in the teacher education. I expect my students to look for information on the Internet as well as in books or in traditional ways.*

Another teacher stresses the advantages of diversity and multivocality on the Internet compared to one dominant voice of the traditional course book which seems to be coming obsolete.

> Ingvar Sigurgeirsson, professor, curriculum and instruction: *When the course book we had used was sold out we decided to give up the use of course books and instead to use more diverse resources, handbooks, articles, charpters of books and not the least web-materials of different kinds.*

Communication

In the last years there has been a great deal written about the importance of communication in human learning and we have got a new paradigm presented to stress this view – computer supported collborative learning (Wilhelmsen, Åsmul, & Meistad, 1998). With increased use of web-based conferences and course tools in the distance teaching at KHI, it is obviously a trend to use discussion more as a part of the learning process. However, in their stories some teachers complained that their students did not participate sufficiently, e.g.:

> Gunnhildur Óskarsdóttir, assistant professor, instructional methods: *I thought that some students were not at all taking active part in the discussion and I would like to control that part better next time, making clearer rules about how to participate in discussion. I would even like to make it part of the course assessment. Some students only took part in a kind of social chat while others really were more professional -pointing out and asking for things that matters in academic discussion.*

The problem Gunnhildur described could partly be explained as a cultural phenomenon because at the same time as Icelandic students tend to be good at narratives the Icelandic school system has not promoted student participation in academic discussion. So the problem has to be dealt with not only technically but on a cultural level. We will have to teach our students to take part in academic discourse in different fields.

Publishing Teaching Material on the Internet

Among advantages of the Internet are the inexpensive publishing possibilities, which must affect the way teachers deliver their knowledge or teaching materials. And it is not only ordinary text they can deliver but multimedia, with pictures and audio.

> Thorunn Blondal, assistant professor, Icelandic and linguistics: *I sent in (in LearningSpace) subject for discussion which I expected my students to respond to and discuss; I wrote notes or letters or articles which were part or extention of the reading material; I made them write notes and respond to one another; I published presentations (Powerpoint) and annotations regarding the material; I published a video with a new TV- program that was directly connected to our discussion; I planned a workshop on Icelandic language policy where I dealt discussion subjects between 6 groups and each group schould send an article to which the other schould respond, and all this was supposed to happen as near real time as possible.*

This story should give other teachers ideas and courage to try out new ways of dealing with distance teaching using the different possibilities that ICT offers.

Publishing Students' Materials

In the schoolyear 1999-2000 very few teachers showed interest in publishing students' projects, but this year we have seen a remarkable increase of inrerest in that possibility. (Examples include children's "microstories" collected by students in the pre-school department and stories and other materials collected from old people by history education students.) This practice helps motivate students and to makes their work visible outside the university. It is important that the scool projects are made authentic, useful and thereby meaningful in a social context. Giving students the feeling that they participate in social construction of knowledge in their field helps make their studies more meaningful. Students themselves express positive attitudes toward publishing their material on the web and feel they are preparing for their job as school teachers.

Conclusion

This study describes on-going action research conducted at an Icelandic teacher education institution. The method in itself might hopefully be used as a model of good practice which aims to promote successful use of ICT within an educational institution. It is not clear of how much use "stories" such as the ones described here are to people outside our institution. But we hope that these stories will help us to get more people to see the possibilities ICT has to offer and to avoid pitfalls others before them have fallen into. Currently, here at KHÍ, more and more teachers gain Internet literacy: have their own home-pages; make web-sites for their courses alone or in collaboration with other teachers; use conference systems and course tools in their distance teaching; but teachers still need support - technical and pedagogical on how to teach in this new Net-based-environment. We intend to use ICT to support them on both frontiers and work on the construction of a collaborative culture within KHÍ.

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Biographical Sketches

Solveig Jakobsdottir has a Ph.D. and M.Ed. in instructional systems and technology from University of Minnesota. She is an associate professor of distance education (DE) at KHÍ (Iceland University of Education). She has made presentations on the use of information and communications technology and DE in Iceland in Prague for a Unesco committee on Institute of Information technologies in Education - and in Keele UK invited as a guest speaker last January at ESRC (Economic and Social Research Council). She has made several presentations related to technology use in education at AECT conferences (1993-1997) AERA (1995), and IFIP (1999).

Address: KHÍ v/Stakkahlid
105 Reykjavík, Iceland
E-mail: soljak@khi.is
Phone: 011-354-563-3934

Thuridur Johannsdottir has an M.Ed. degree from Iceland University of Education. Her thesis was titled Let's Set the Net to catch Education. She also has a background in Icelandic literature. She is currently an educational technology adviser for faculty at Iceland University of Education and project manager at the KHÍ research centre. She has taught many courses and lectured in Iceland and Europe on literature teaching and use of information technology in education. She has edited books on literature for secondary student, created a web-site on literature for children (http://barnung.khi.is/), and written journal articles on children´s literature and information technology. She has a long experience of Scandinavian cooperation on educational and cultural matters.

Address: KHÍ v/Stakkahlid
105 Reykjavík, Iceland
E-mail: tjona@khi.is
Phone: 011-354-563-3932

Interactive Television in the Badger State: A Partnership for Learners!

Clark Jillson, Director
Southwest Rural Telecommunications Network Consortium (SRTNC)
CESA #3

Robert Hannu, Director
Wisconsin Overlay Network for Distance Education Resources (WONDER)
Northcentral Technical College

Background of WADEN

WADEN (Wisconsin Association of Distance Education Networks) grew out of meetings between the ECB (Educational Communications Board) and Wisconsin's distance education network directors. The purpose of these meetings was to share information on distance education activities that were going on throughout the state. As coordination of distance education programming went through a number of transitions, the network directors elected to form WADEN in 1997. Membership is open to any organization with an interest in distance education partnerships, including K-12 schools, technical colleges, colleges, universities, businesses and government agencies. WADEN's vision is "that every resident of the State of Wisconsin will have equitable access to quality K–12, post-secondary, and continuing adult education opportunities regardless of their physical location in the state, based upon the needs of the learner, instructor, or citizen being served. Ultimately, all distance education systems in the state will be interconnected with the ability to acquire, at an affordable price, the appropriate technology needed for specific audio, video, and data applications." Membership currently includes directors and coordinators from over 40 networks and affiliates.

Evolution of Instructional Television in Wisconsin

Wisconsin has a long history of using technology to bring education to the citizens of the state. Beginning early in the century with WHA radio and evolving through the development of other broadcast, audio conferencing, and audio graphic systems, interactive television became a dominant force in distance education with the founding of Project Circuit in 1979. Approximately 9 ITFS (Instructional Television Fixed Service) networks evolved in the 1980's and led the way to the modern digital fiber optic networks which began with ERVING (1990), NWECS (1992), WestWING (1994), and continued with a number of other pioneering consortia such as SCING, WONDER, SRTNC, and TRITON. The need for a seamless statewide network prompted the development of the TEACH (Technology for Educational Achievement) Wisconsin program, initiated by Governor Tommy Thompson in January 1997. It provides a subsidy for schools to help defray the cost of the fiber optic link to the statewide BadgerNet video network as well as grants to support technology initiatives. It also provides a standardized state contract for video service and the purchase of ITV (Instructional Television) room equipment. The first TEACH networks were activated in the fall of 1998. Currently, there are over 30 DS-3 networks that are operating in the state that provide access to 353 classrooms.

Benefits of Partnerships

The benefits of this organization are the promotion of communication, sharing of programming opportunities, and enrichment of curriculum offerings to all schools. Individual schools are able to develop and communicate their unique needs at the local level – or from the grass roots. The partnerships created through WADEN allow schools to expand course sharing, develop partnerships among high schools, technical colleges, colleges, and universities as well as enrichment opportunities with museums, zoos, etc. both within as well as outside Wisconsin through the use of ISDN gateways. The DS-3 sites can connect with compressed video sites within Wisconsin as well as throughout the country.

UW-Extension supports a WADEN website and program database. (The web address is www.uwex.edu/disted/waden/) This database provides a wealth of information on statewide network class offerings that include course descriptions, numbers of students served, schedules, network usage, etc. The website also includes general information on WADEN and its members along with links to other distance education resources. A WADEN listserv also acts as a valuable tool for communicating between networks. Distance education facilities are used to provide daytime classes to high school junior and senior students, evening adult continuing education, and staff development and graduate courses for faculty. Exceptional education needs are also being addressed through connectivity with agencies and institutions including the Wisconsin School for the Deaf, the School for the Visually Impaired, and other sites. The ITV studios also provide meeting sites that save tremendous time in travel costs.

Technical colleges and universities offer courses to other post-secondary sites throughout the state as well as high schools. They also offer career planning for high school students, focus sessions on specific program areas, CAP classes, youth options courses, and sessions on college selection tips.

Grassroots Operations: How a Network Functions

Typically, a regional ITV network has a governing board, programming committee, technical committee, site facilitators, and a small staff that may include an assistant and/or scheduler and director. Local school representatives are the critical components in decision making for the network. The key to success in any instructional television network is effective and enthusiastic teachers. The regional networks depend on committees made up of teachers, counselors, principals, and administrators to provide direction for the instruction offered on the network. Student achievement is the fundamental premise of all program planning.

Each regional network retains local control of class scheduling, with programming ultimately determined by the individual schools based on local needs. ITV classes scheduled over any network, while meeting all state curriculum standards, do not require special state approvals.

Technical Information

The BadgerNet video network uses codecs, transmission equipment, and scheduling software manufactured by Tektronix, Inc. Seventy-two DS3 circuits provide connectivity between the 23-video switches located throughout the state. A typical BadgerNet distance education classroom consists of a computer-based system controller as well as cameras, monitors, microphones, a document camera, VCR, speakers, echo cancellers, and video routers. Through the assistance of the Wisconsin Department of Administration, a standard statewide equipment bulletin was developed for ITV classroom equipment that eliminates the need for each school to obtain individual price quotations.

In addition to providing the video/audio link between schools, each connection also provides Internet connectivity over T1 lines that are embedded in the DS3 link. This provides the added benefit of affordable access to the Internet.

WADEN provides a line of communication with state agencies for future decision-making that affect distance learning in Wisconsin in order to better ensure the needs are being met for all involved.

Summary

The mission of WADEN is to work collaboratively to advance and improve distance education opportunities for all learners in Wisconsin. Through its efforts, courses and educational programming are blossoming throughout the state. Learners of all ages are experiencing the benefits of this growth. Courses that otherwise would not have been available in communities are now easily shared. Professional development and certification requirement offerings are more accessible. The educational opportunities being shared throughout the state are the direct result of input from the local schools. Teachers, students, principals and administrators are the best resources for identifying educational needs. WADEN provides the vehicle for communicating that need to others who can help.

Biographical Sketches

Clark Jillson has worked in distance learning for four years and is currently the director of the Southwest Rural Telecommunication Network Consortium (SRTNC). Prior to his current position, Clark worked in the broadcast production field for three years, working for WUTR-TV in Utica, NY and Adelphia Cable Communications in Syracuse, NY. Clark currently serves as the chairperson of the Wisconsin Association of Distance Education Networks (WADEN). He has a Bachelors Degree inBroadcast Technology Management from the University of Wisconsin–Platteville.

Address: CESA #3
1300 Industrial Drive
Fennimore, WI 53809
E-mail: cjillson@cesa3.k12.wi.us
URL: http://www.cesa3.k12.wi.us
Phone: (608) 822-3276, Ext. 259
Fax: (608) 822-3828

Robert Hannu has worked as Director of the Wisconsin Overlay Network for Distance Education Resources (WONDER) since August 1995. He has been involved with distance education since 1977, spending ten years with the University of Wisconsin–Extension's Teleconferencing service and eight years at St. Cloud Technical College in St. Cloud, Minnesota, as Regional Coordinator of the Central Minnesota Distance Education Networks. Mr. Hannu is a graduate of the University of Wisconsin- Platteville, with a degree in Industrial Technology, and is the past president of the Wisconsin Association of Distance Education Networks (WADEN).

Address: Northcentral Technical College
1000 West Campus Dr.
Wausau, WI 54401-1899
E-mail: hannu@northcentral.tec.wi.us
URL: http://www.northcentral.tec.wi.us/wonder
Phone: (715) 675-3331, Ext. 4051
Fax: (715) 675-5868

Identification of Successful Learning & Learner Support Systems From a 3rd Year eHighSchool Program

Susan L. Jones, Ph.D., Assistant Professor/Co-Principal Investigator
U.S. Dept of Education, PT3 Grant
College of Education/College of Natural and Applied Sciences
Southwest Missouri State University

Introduction and Creation of SMSU's eHighSchool

Wanted: Mathematics and Science teacher – High School level. Immediate opening. Job duration – Permanent. Work term – School year. Certification required – Yes. Specialties/Certifications – Math/Science. Apply at School District. Sound familiar? Across the nation, school districts are in dire need of teachers. It was predicted five years ago that America would need to hire 2 million teachers over the next 10 years because of the growing school enrollments and the rising number of teachers retiring. Across the nation this need is still indisputable. Specifically in Missouri, many public schools, particularly rural schools, continue to have trouble filling both math and science teaching positions. In addition, rural school districts find that retaining the teachers that they do hire is as difficult. In response to this burgeoning need, Southwest Missouri State University (SMSU) created their own eHighSchool. "The mission of the SMSU eHighSchool is to support the educational efforts of Missouri public schools through the use of proximity-based education in the delivery of high school curricula" (eHighSchool website, June 14, 2001). The eHighSchool supports school districts in a 24 county service area. The creation of the eHighSchool is an effort to help school districts meet expectations such as Missouri's Show-Me Standards, the Curriculum Frameworks, and MSIP accreditation. In doing so, the eHighSchool strives to follow established curricular rules and regulations as set forth by the Missouri Department of Elementary and Secondary Education (DESE) and guidelines as set forth by the Coordinating Board of Higher Education (CBHE). The eHighSchool offered its first online Physics course to high school students during the 1998-1999 academic school year. The following year brought an increase in the type of courses offered which included ITV-Physics; online/blended technologies for Chemistry, Algebra, Fiesta (Spanish), and computer application course. The eHighSchool is operated under the auspices of the College of Natural and Applied Sciences (CNAS) through the Center for Scientific Research and Education (CSRE).

SMSU's eHighSchool Hierarchical Structure, Organizational Roles and Funding Resources

Since the eHighSchool is operated under the auspices of the College of Natural and Applied Sciences, the Dean of the College of Natural and Applied Sciences is the head supervisor of the Center for Scientific Research and Education. The Director of the CSRE is responsible for interdisciplinary programs that directly relate to scientific research, in addition to being responsible for the supervision of the personnel involved in computer support for faculty and staff and information technology. A retired public school Superintendent, who is currently a Research Associate for the CSRE serves as one of the Co-Superintendents for the eHighSchool. A prior public school master teacher who is currently a college instructor at SMSU fills the second Assistant Superintendent position. The Assistant Director of the CSRE is responsible for Education programs affiliated with the CSRE and also serves as the Principal for the eHighSchool. The eHighSchool also has an instructional designer who works individually with the eHighSchool master teachers and is also an Assistant Professor in the College of Education, Instructional Technology Department at SMSU. The CSRE also maintains a modest support staff who provide expertise and support to the eHighSchool including an instructional technology support specialist, four distributed user support specialists, an administrative coordinator, and preservice student workers' who gain real-life experience and offer assistance as needed.

The eHighSchool is funded by a variety of different sources. The largest portion of funding comes from the public schools by way of tuition/supplies. Another portion of funding comes from U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT3) grant that was awarded to SMSU in 1999. The PT3 grant was renamed to represent the "Show-Me" state of Missouri at SMSU and is referred to as the "Show-Me" Tomorrow's Teacher Using Technology (ST3) grant. The U.S. Department of Education awarded SMSU an approximate amount of $1.5 million dollars to provide university faculty with instructional technology design experts who would provide intensive professional training to infuse technology strategies and applications into selected university courses. In addition, revised, or modified courses would require future teachers to create K-12 lesson plans, projects, and units of study that would incorporate technology. Furthermore, the grant would allow interactions between faculty members and technology-savvy K-12 educators to enhance practical applications that should be taught at the university level for future use in the public schools. Also, future teachers would be introduced to multifaceted technology applications through site visits, videoconferencing field experiences in K-12 classrooms through the eHighSchool; interaction with the St. Louis Science Center; and the global community. The eHighSchool also receives funding from the Executive Assistant to the President from his discretionary funds. Likewise, the College of Natural and Applied Sciences Dean provides funding from his administrative account to fund educational equipment and supplies, as well as start-up equipment for the eHighSchool (Norgren, personal communication, 6/14/2001).

SMSU's eHighSchool Delivery Technologies

SMSU's eHighSchool delivers courses synchronously and asynchronously utilizing a variety of delivery systems including: audio, video, computing, print, and combinations of technologies that take advantage of the special attributes of each technology for both synchronous and asynchronous communication. Courses are created by individual instructors on a course management system known as Blackboard CourseInfo and delivered through the Internet. Other courses are delivered through Interactive Television (ITV) via IP. And yet, other courses utilize a variety of blended technologies to deliver course content. Blackboard CourseInfo delivers the chemistry course online while utilizing blended technologies including audio and print. Blackboard CourseInfo delivers the Algebra course online while using blended technologies including video, audio, and print. Blackboard CourseInfo delivers the online Physics course while using blended technologies including print and audio. The ITV Physics course also uses blended technologies including print and audio. The Fiesta (Spanish) course is delivered online by Blackboard CourseInfo while utilizing blended technologies including, video, audio, and print. The Computer Applications course is delivered online by Blackboard CourseInfo while using blended technologies including audio and print. Each instructor has the academic freedom to determine the appropriate delivery system based upon their course objectives and the individual needs of their students.

SMSU's Learning & Learner Support System

To have a successful eHighSchool program there are many learning and learner support systems that must be in place. Some of these include University commitment by upper administration; faculty/teacher "buy-in"; qualified and certified instructors; technology (software and hardware) availability, maintenance, and, upgradability; technology accessibility and compatibility; staff; dedicated support personnel; and an advisory panel or board to maintain contact with the community and their specific needs.

Without learning and learner support systems in place too many problems often begin to plague the program and often destroy what was being built. Critical to the success of any program, particularly the SMSU eHighSchool are two critical areas. First, learning and learners support for faculty/teachers as well as secondly, learning and learner support systems for students.

Supporting master faculty/teachers who control all aspects of their course is vital to the success of the eHighSchool. One cannot merely take what is done in the traditional classroom and transport it into a distance learning environment. In fact, the course must be redesigned or modified utilizing what are referred to as "reconfiguration guidelines." Faculty/teachers of the eHighSchool who worked with the instructional designer were trained on the importance of the following reconfiguration guidelines so that they could include them as they designed their course. "The reconfiguration guidelines emphasize five distinct areas specific to distance learning environments, but may be utilized in traditional teaching environments as well. These five areas include: (a) presentation skills, (b) logistics—planning and organizing a telecourse, (c) interactivity, (d) visualization, and (e) correlated handouts" (Jones, 2000).

As important to the eHighSchool, as support for faculty/teachers is the learning and learners support system that has been put into place for students. To ensure that students are supported throughout their distance learning experience there is an on-site pre-check of their individual school facilities, technology and staff. Next students are brought on-campus during a student orientation period to ensure that they meet the teacher, know what is expected of them, given the realities of what it is like to be an online learner, trained on how to utilize and operate the technology, as well as logged in to their course website. During this time, site facilitator training has been conducted, which is now being expanded into a weeklong training opportunity. The site facilitator is considered one of the most important components to the success of SMSU's eHighSchool students. The site facilitator provides for the students at their school direction, clarification, and guidance. He/She works as a mediator of communication between the eHighSchool teacher and the student and maintains constant communication with the students and is often the eyes and ears of the eHighSchool teacher. The site facilitator also works to maintain open communication with the public school principal and parents. The SMSU eHighSchool has a retention rate of approximately 93% whereas; many eHighSchools have a retention rate of approximately 30-40% (Norgren, April 14, 2001). In addition, another very strong component of the learning and learner support systems provided to the SMSU eHighSchool students is the face-to-face labs that are done by faculty/teachers of the eHighSchool or by preservice teachers who assist the eHighSchool faculty/teachers at their own school. Faculty/teachers of the eHighSchool or their assistants travel to the public schools with whom the eHighSchool serves and conduct real experiments, demonstrations, simulations and so forth. This gives the eHighSchool student's further opportunity to spend face-to-face time with their teacher and get real hands-on experience and help with the more complex labs.

SMSU's eHighSchool Future Plans

Where the future of the eHighSchool will go is uncertain. The sky is the limit. There continues to be a growing need for science and mathematics courses at all levels and across the nation. In fact, additional course request are common. Will the eHighSchool offer the same courses and remain primarily "proximity-based" which has made it so successful, or will the eHighSchool move beyond "proximity-based" and offer courses nationally, or even sell the courses that are already created as pre-packaged? The fate of the eHighSchool has yet to be decided.

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Biographical Sketch

Dr. Susan L. Jones is an Assistant Professor at Southwest Missouri State University in the College of Education, Instructional Technology Department, where she teaches instructional media technology to pre-service teachers. She is Co-Principal Investigator of the 1.5 million dollar U.S. Department of Education Grant, "Preparing Tomorrow's Teachers to Use Technology (PT3). In addition, she is currently responsible for overseeing the instructional design process of SMSU's eHighSchool, which provides proximity-based distance learning opportunities to rural high schools in Missouri. As president of her own consulting firm, Creative Educational Consultants, she consults with public schools, universities, private businesses, and governmental agencies.

Address: Southwest Missouri State University
901 S. National, Hill Hall, #446
Springfield, Missouri 65807
E-mail: slj469f@smsu.edu
URL: http://www.smsu.edu,
http://www.cnas.smsu.edu/e-highschool
Phone: (417) 836-6035
Fax: (417) 836-6252

Hybrid I: UW System Hybrid Course Project—Overview, Faculty Development, Student Resources

Robert Kaleta, Director
Learning Technology Center
University of Wisconsin-Milwaukee

Carla Garnham, Instructional Innovator
Learning Technology Center
University of Wisconsin-Milwaukee

Supported by a grant from the University of Wisconsin (UW) System, the Hybrid Course Project identified three goals: 1) develop Web resources on the Hybrid course model for teaching Hybrid courses; 2) create a model faculty development program for designing, developing and teaching Hybrid courses; and, 3) help seventeen instructors transform traditional courses into Hybrid courses. This presentation reports on the activities and the "lessons learned" during the project, which was active from January 2000 through June 2001. The Project Website Resources, including all materials developed for the faculty development process, are listed at the end of this paper.

Hybrid Course Model

"Hybrid" is the name commonly used to describe courses that have moved a significant part of course learning online, making it possible to reduce the amount of classroom seat time. Hybrid courses are also called "blended" and "mixed mode" courses.

The goal of Hybrid courses is to join the best features of in-class teaching with the best features of online learning to promote active independent learning and to reduce class seat time. Using computer-based technologies, Hybrid courses permit instructors to redesign some lecture or lab content into case studies, tutorials, self-testing exercises, simulations, group collaborations, and other online learning activities.

The University of Wisconsin System project funded seventeen instructors from a four-year research university (University of Wisconsin-Milwaukee) and 2-year colleges (UW-Rock County, Sheboygan, Washington, and Waukesha) to redesign their courses into Hybrid courses. The project coordinators planned the work during spring 2000, worked with faculty during the course development process in summer and fall 2000, and the instructors delivered the new Hybrid courses in spring 2001. The participating instructors represented disciplines in the humanities, social sciences, and professions. They adopted different approaches to the Hybrid model, based upon their instructional styles, their course content, and their course goals.

For example, a Communication instructor moved all lectures and many class activities online and met with students solely for the performance aspects of the course. Another instructor reduced the class time in a writing course by asking students to post their essays to discussion forums and employing peer critiquing in order to provide more time for the service learning component of the course. Another simply used the Hybrid model to cut a non-productive half hour off of a ninety-minute evening course.

All instructors were positive about their experience with the Hybrid model and plan to use it again. Most significantly for the project's goals, all instructors adopted a more student-centered, active learning approach in their Hybrid course that they plan to use in their traditional and Hybrid courses in the future.

All agreed that developing the Hybrid course had been significantly more time-consuming than developing a traditional course, primarily because of time necessary to learn various online skills, such as the Blackboard courseware or how to facilitate discussion forums. But they would all do it again. Here are some responses from participating instructors about their reactions to teaching a Hybrid course:

- "My students have done better than I've ever seen; they are motivated, enthused, and doing their best work." (English instructor)
- "I sense a heightened level of enthusiasm in my students." (Sociology instructor)
- "Positive for me and positive for the students." (Art History instructor)
- "Introverts, who are quiet in the face-to-face class, really participate online." (Educational Psychology instructor)
- "I was tired of hearing myself talk. This gets so much more student interaction." (Communication instructor)
- "The Hybrid allowed me to do things in my course that I've always wanted to do and couldn't." (Archaeology instructor)

Major Lesson Learned: The Hybrid course model is flexible. It accommodates courses of different disciplines, different class sizes, different instructor teaching styles and student learning styles, and different percentage reductions of in-class seat-time. One size does NOT fit all!

Faculty Development Model Created for the UW Hybrid Project

As class seat time is reduced and a significant part of learning is online, moving to the Hybrid model requires an extensive course redesign. Faculty must reexamine their course goals and objectives, design online learning activities to meet those goals and objectives, and effectively integrate the online activities with the face-to-face meetings. In order to help faculty with this process, the project team structured a faculty development program to provide instructors with the background and guidance necessary to design, develop, and teach effective Hybrid courses.

It is important for faculty who are going to teach Hybrid courses to experience Hybrid courses as students do. Therefore, the Hybrid faculty development program is essentially a Hybrid course involving online materials, independent learning activities, online discussion, and face-to-face meetings and activities. This format not only gives faculty experience in learning in the Hybrid environment, but it also encourages good Hybrid course practices.

Posted on the website of the Hybrid Course Project (see below, "Project Website Resources") is a summary of the faculty development process used with the seventeen faculty participants. The site includes not only a step-by-step summary of activities, but it also contains copies of the actual assignments and learning activities and links to the work produced by the faculty participants.

After teaching their first Hybrid courses, the participants were surveyed and asked to evaluate the extent to which the faculty development process prepared them to design, develop, and teach a Hybrid course. Based upon their responses and a self-reflection by the project team, a revised and enhanced faculty development program for teaching Hybrid courses was constructed.

Here are some responses from participating instructors to the question, "If you could give only one piece of advice to someone who is just getting started with a Hybrid course design, what would that advice be?"

- "Start modestly. I got really carried away with what I wanted to do and I had to cut a lot out." (English instructor)
- "Keep it simple." (Business and English instructors)
- "Don't just replicate the textbook or your lectures onto the computer screen." (Psychology instructor)
- "Don't make the technology too challenging." (English instructor)
- "Figure out good ways to integrate the online learning activities with the face-to-face classes." (Business instructor)

Major Lesson Learned: Faculty value interacting with each other as they work through the process of redesigning their courses, and they especially value the opportunity to talk with faculty who already have experience teaching Hybrid courses.

Resources Developed for Students Enrolling in Hybrid Courses

To assist the students enrolled or considering enrolling in a Hybrid course, the project team developed a website to help students understand the course model, find campus support services, and assess their own preparedness to take a partially online course. The website begins with the key question: "Should I take a Hybrid Course? 'Hybrid' courses aren't for everyone! This site will help you decide if enrolling in a Hybrid course is for you."

Some students initially have trouble adjusting to the Hybrid model of learning. They need lots of information and an orientation to this new style of learning. The students' time-management skills are especially important in Hybrid courses. One of the most common comments from the participating instructors was describing problems with students not taking responsibility for their courses and lacking time-management skills.

Technology skills and access to fast modem connections were concerns for some students. All of the participating instructors agreed that the first week of class should be dedicated to technology issues and to socialization. A number of the instructors observed that some students dropped the Hybrid course because of their fear of the technology and/or their perception that the course would be more work than a traditional course. But all of the instructors also agreed that if the students got past the first two or three weeks, they could successfully manage the differences encountered in a Hybrid class.

Students reported high levels of satisfaction with the Hybrid courses. Their most frequent comment (by far) was that they liked the convenience and the freedom to work at their own pace. The following are selected questions from surveys administered to students in Hybrid courses at the end of spring semester 2001:

	Agree	Disagree	No Opinion
I could control the pace of my own learning. (n=282)	69%	19%	12%
I could organize my time better. (n=282)	77%	11%	12%
The time I spent online would better have been spent in class. (n=282)	16%	67%	17%
There should be more courses like this. (n=282)	61%	16%	23%

Major Lesson Learned: Students do not understand what a Hybrid course entails. They see the online work as "homework" even if it is time they would have previously spent in class in a traditional course;

students do not count time in class as "work," but they definitely perceive time online as work! The instructor should explain the course's Hybrid structure to them several times and in different ways.

Project Website Resources

University of Wisconsin System Hybrid Course Project website:
http://www.uwm.edu/Dept/LTC/hybrid.html

Faculty Development Model for Hybrid Project website (including the schedule and copies of all the materials we used): http://www.uwm.edu/Dept/LTC/fac-dev.html

Hybrid Courses at UWM ~ Information for Students website:
http://www.uwm.edu/Dept/LTC/hybridcourses.html

Biographical Sketches

Robert Kaleta is director of the University of Wisconsin-Milwaukee's Learning Technology Center, the campus faculty development center for instructional technology. This Center focuses on assisting mainstream faculty with their efforts to integrate technology into their courses. He received his PhD from the University of Texas and has presented papers recently on the Hybrid course model, working with mainstream faculty, and using technology for teaching. As an instructional designer, he has assisted a number of faculty with their efforts to integrate technology into their teaching. As an instructor of university psychology courses, he has extensive personal experience using technology for teaching.

Address: P.O. Box 613
University of Wisconsin-Milwaukee
Milwaukee, WI 53201
E-mail: kaleta@uwm.edu
Phone: (414) 229-5136
Fax: (414) 229-6758

Carla Garnham is an Instructional Innovator in the University of Wisconsin-Milwaukee's (UWM) Learning Technology Center. As the Project Coordinator for the UW System Hybrid Course Project, she has worked closely with the participating instructors. She is also the primary author and coordinator for UWM's submission to the Pew Charitable Trusts Course Redesign Project, which was one of the 20 finalists in 2000-01 Round III competition. Carla received her M.A. from the University of Minnesota and B.A. from Cornell University. She has a thirty-year career in higher education including positions as statistical software consultant, university instructor, and CIO.

Address: P.O. Box 613
University of Wisconsin-Milwaukee
Milwaukee, WI 53201
E-mail: cgarnham@uwm.edu
Phone: (414) 229-4319
Fax: (414) 229-6758

eLearning Project Success: The Critical Factors
Kohl's Case Study of Success

Jon Kaupla
Manager of eLearning
Kohl's Department Stores Corporation

Bradley Nycz
eLearning Coordinator
Kohl's Department Stores Corporation

eLearning Project Success

Just like any other project, eLearning projects have limitations in order to stay with in budget and on time. Of course no one begins a project with the intention of going over budget, past the deadline, or even worse, going beyond both, but there are several factors that feel out of our control that sometimes influence these limitations. The challenge with any project is that the project owner takes control of those seemingly uncontrollable factors. Easier said than done, right?

It really is just that easy. The difficult part is actually getting your team to implement such a change and to implement it successfully. Whether you are a one-person team or a team of 20, you need to make sure that everyone on the team uses one set of standards. The are several influences that can make or break a project, but it is more detrimental to a project if those influences are coming internally. The easiest way for this to happen is if a team does not have a set of standards in place or the team does not follow the standards that exist.

It is important to have a stable team because as a team, you will be working with a variety of different people for various reasons. Each area has different time availability and resources for your project. The standards you have set ahead of time will ensure that all of your team members will follow the same procedures and stay consistent with the project plan that was generated ahead of time.

Critical Factor 1: Subject Matter Experts

Now that we have standards and decreased our risk for internal disruption, we can begin exploring the external factors that can sway a course from your carefully crafted project plan. The top priority of any eLearning course is the SMEs or Subject Matter Experts. As the title implies, they are experts in the area you are trying to develop training. Because of this, your SMEs are the most critical factor to your project's success. With their extensive knowledge and documentation, they provide the best picture regarding what type of training needs to occur, but that also means that you need to put their schedule into consideration for your project. It is difficult to get a subject matter expert to sit down, read a storyboard and give useful feedback before the deadline. However, it is necessary that their feedback becomes the highest priority in order to meet the project deadline.

Every SME will be able to give you a thousand reasons why this training is necessary and a million reasons for why they are too busy to meet your deadlines. So now what? Several important things need to happen to put this project on the top of a priority list for a SME. First and foremost, none of us like extra work so the challenge is to prove to the SME that this is not extra work and that this will actually make their job easier. The subject matter experts are usually those individuals that work closest with the software package or the procedures that you are trying to train. This means they are also the individuals that have to field the largest amount of questions about the training material. The SMEs also need to document and prove that not only will this reduce the amount of questions they will have to field, but that the process they are involved in will become much more efficient and error free.

Critical Factor 2: Documentation

Streamlining the eLearning development process has brought many companies to a storyboard free development process. While the design of a project does take a considerable amount of time, eliminating storyboards is not the way to save time. A construction company would never leave out the architect when erecting a building and a project manager should never leave out their architect, the instructional designer. Storyboards are not always the best approach for each team, but Kohl's has proven that some form of documentation is necessary for staying on track. A large amount of time is spent in the instructional design stage in order to keep the SMEs focused on the objectives on hand, which will in turn provide the highest quality of training possible.

Storyboards are not the only piece of documentation that must be done with every project. Some of the most vital pieces of documentation are the instructional design specifications and functional specifications. The ID document is the outline for the entire course, the expectations for the SMEs and the standards that will be used throughout the training. Just like the storyboard process, upon completion of this document, the SMEs for the project will be required to sign-off on the document. This sign-off holds the SMEs accountable for your expectations of them and will typically give a greater sense of ownership to the SMEs. This sign-off is the point where Kohl's eLearning team has been able to take complete ownership of a project and make the necessary executive decisions to remain on schedule.

The second piece of documentation is the functional design specification, which Kohl's has typically generated from its technical positions. This document is where all set standards from the technical side are put in to writing. Typically this is the document that is missing and will have the greatest affect on a timeline. This document is used for external and internal courses and lays out the expectations on how the entire course will function, the layout of the screen and the data that is being tracked. All of this documentation is signed off on, guarantees what is expected and holds everyone to those expectations.

Critical Factor 3: Finances

Whether eLearning is being developed internally or externally there is a substantial amount of financial backing that must occur for a project to be a success. Many project managers obtain the necessary finances up front, but fail to sustain such support throughout the entire project or going forward with future projects. By basing all of the eLearning projects on its return on investment will ensure a project success and form a stable base to build an eLearning platform. The key to demonstrating a return on investment with eLearning projects is the data that is retrieved from the training. eLearning offers a powerful training tool that, unlike classroom training, can be tracked down to any level of detail. This detail is what provides the factual information that every project can be based. Such a foundation is what will build the support from the decision-makers of your organization.

Conclusion

At Kohl's we realize that there are more factors that can determine the success of a project, but SMEs, documentation and the finances are the three critical factors of Kohl's eLearning success. Like so many organizations that have gone down the path of eLearning Kohl's has figured out keys for their success.

These keys are not only what has helped to build a successful eLearning platform, but it allows the ability for Kohl's to continue to improve processes, increase efficiency and most important deliver higher quality training materials. In the ever-changing field of technology a successful organization is not only an organization that can meet the established timeline and budget, but also can keep up with the technology without getting trapped in the short-lived trends. Technology has provided a means for training to move from the classroom to the computer lab in a successful training platform that is here to stay. It is left up to the organizations, delivering the training, to turn the critical factors of success in to steps in the development process.

Biographical Sketches

Jon Kaupla is the Manager of eLearning in the Training and Development Department at Kohl's Department Stores.

Address: N56 W17000 Ridgewood Dr.
Menomonee Falls, WI 53051
E-mail: jon.kaupla@kohls.com
Phone: (262) 703-2314

Bradley Nycz is the eLearning Coordinator in the Training and Development Department at Kohl's Department Stores.

Address: N56 W17000 Ridgewood Dr.
Menomonee Falls, WI 53051
Phone: (262) 703-2138
E-mail: bradley.nycz@kohls.com

Keeping eLearning Engaging

Jon A. Kaupla
Manager of eLearning
Kohl's Department Stores

Bradley Nycz
ELearning Coordinator
Kohl's Department Stores

The Growth of eLearning

ELearning is one of the fastest growing industries in the United States, and around the globe. It is estimated that it will be an 11.5 billion-dollar industry by the end of 2003. Many small and large organizations, from not-for-profits to for-profits, are implementing some type of eLearning.

Unfortunately, many organizations are not focused on making eLearning "learner-centered." This includes designing the eLearning event to be clear, engaging, functional and meaningful to learners.

In this session, "Keeping eLearning Engaging: The Basic Steps," we will explore the factors to consider in audience analysis; critical functional aspects in the design of eLearning; specific instructional strategies, design decisions and multi-media use that will increase retention and interactivity within eLearning and; simple and effective ways to blend traditional learning (classroom, video-based, on-the-job) and eLearning.

Factors to Consider in Audience Analysis

Audience analysis is a critical step in any instructional design project, including eLearning projects. Critical factors to consider when completing an analysis include; experience with the medium, language ability or preference, previous training or job experience and special requirements.

Analyzing experience with the eLearning medium, including experience with personal computers is important in understanding your audience. For example, if your audience has never used eLearning or computers you may need to supplement the eLearning solution with materials to help acclimate the audience to the medium. We have found that learners are much more successful with eLearning if they understand the basic functionality of our courses.

Understanding language ability or preference of your learners is also critical. If English is a second language of your learners, it may be necessary to offer reference materials or online dictionaries. It may also be necessary to translate the entire course, or portions of the course (e.g., audio only).

If learners have previous knowledge of the subject matter you are teaching, you may offer pre-tests that guide them to specific content related to their needs. And finally, if your audience has special requirements such as signing, Braille, color labeling (due to color blindness) you will need to adapt your solution to meet these requirements. At Kohl's we have offered scripts of our courses to students who are deaf, or have difficulty hearing the audio within our eLearning courses.

Functional Aspects in the Design of eLearning

Most organizations do not have the technical expertise in the area of eLearning. Many organizations begin this process without doing the needed research. Aspects that need to be addressed include eLearning development tools, implementation hardware, and design implications on development time and cost. All of these factors ultimately have an affect on the "end-users," or learners.

There are numerous eLearning development tools on the market today (Toolbook, Dreamweaver, HTML, Director, Flash, Authorware, etc.). Choosing your development tool, or tools, will depend on the hardware/software that your learners will be using to take your courses. For example, you would not want to develop courses in HTML if your learners do not have a browser to view the materials.

Development time and cost can vary greatly depending on various factors. A course that has simple navigation (e.g., next and back) and only text (vs. graphics, audio and/or video) would be low cost and quick to create. On the other hand, a course that has full multimedia and more complex navigation (pause function, bookmarking, ability to write online notes, etc.) and reporting capabilities, would be costly and take the maximum amount of time to develop (400 + hours of development time per finished course hour).

Specific Instructional Strategies, Design Decisions and Multi-media That Will Increase Retention and Interactivity Within eLearning

Kohl's is using numerous forms of interaction within our eLearning. The table below explains some of the most popular interactions we use, including an explanation and the degree of each type.

Interaction	Explanation	Degree
Software Simulation	Learner interacts with software screens like they would in the actual software	High
Branching Events	Several options to proceed are offered to learner, who can select what they want to learn about next	Medium
Scenario Based Questions	Learners are given a case study and can respond up to three ways. Depending on how they respond they receive different feedback/direction	High
Drag and Drop/Ordering Questions	Up to eight steps of a process are offered to learners who need to put them in the correct order	Medium
Multiple Choice Questions	Standard multiple-choice type question. Learners select one or more correct answers.	Low
Games	Puzzles, Jeopardy type, etc. games are offered with various information	Medium
Mastery Tests	Usually at the end of the course. Ranges from 10-15 questions presented in "a day in the life" of the learner covering all aspects of the content they learned in real life scenarios. If they miss a question, they return to portion of course for review.	High

Simple and Effective Ways to Blend Traditional Learning and eLearning

Adults learn in many different ways. As much as we attempt to address the various learning styles of all of our learners, there are many who do not learn effectively in the eLearning medium. In addition to the issue of learning styles, some of the skill-based objectives that we need to teach are taught better in a classroom or on-the-job.

We have also found that one of the critical success factors in eLearning is learning reinforcement. ELearning cannot be viewed as separate activity versus a part of the broader learning strategy. For example, we require our store managers to take all of the eLearning courses so they understand what is being covered and can reinforce the training on the sales floor.

Kohl's overall learning strategy includes many delivery mediums including eLearning, videos, classroom, on-the-job and job aids. Very few of our solutions use just one of these mediums. For example, our point-of-sale (register) training uses eLearning to teach the basics of sales transactions (two-hour course), and then Associates receive one hour of on-the-job training at a register with an experienced Associate. This training solution has successfully trained over 50,000 Associates!

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Biographical Sketches

Jon A. Kaupla is the Manager of e-Learning at Kohl's Department Stores, overseeing all e-Learning activities for this 400+ store, 5 billion dollar retailer. This currently includes the design and development of e-Learning for over 50,000 employees.

Address: N56 W17000 Ridgewood Drive
Menomonee Falls, WI 53051
E-mail: jkaupla@kohls.com
URL: www.kohls.com
Phone: (262) 703-2314

Brad Nycz is the e-Learning Coordinator at Kohl's Department Stores, overseeing the testing, quality control, reporting and other process improvements for e-Learning activities.

Address: N56 W17000 Ridgewood Drive
Menomonee Falls, WI 53051
E-mail: bnycz@kohls.com
URL: www.kohls.com
Phone: (262) 703-2138

Understanding Independent Learners' Attitudes to and Preferences for Media Technologies

Adrian Kirkwood
Programme on Learner Use of Media
Institute of Educational Technology, The Open University, UK

"Blithering nonsense!" is how one senior opposition politician described the proposals made in the late 1960s for setting up what is now the UK Open University. When the established universities heard about plans for the Open University to enrol part-time adult students for degree-level courses without requiring any form of entry qualification, the vast majority of academic staff was opposed to the idea, as were the officials within the Government's Department of Education. From these politically charged beginnings, the University soon grew to be the largest in the UK. It currently has over 200,000 enrolled students across the whole of the European Union, in Eastern Europe and also in other parts of the world. It has a very good reputation for high quality teaching (as assessed by the UK government's higher education Quality Assurance Agency) and for research. Courses are offered in a wide range of subject areas: from Arts & Humanities, Social Sciences, Education & Language Studies, Health & Social Welfare, through to Science, Technology, Mathematics & Computing and Management (Europe's largest Business School).

In those early days, the institution was often referred to as 'The University of the Air', because all courses included television and radio programmes made for the university and broadcast to the UK population at large by the BBC. However, it has always been the case that Open University courses use 'multiple media' – exploiting a wide range of media, with the broadcast programmes accounting for no more than 5-10% of student study time and with the specially written text materials forming the core components. After 30 years, the university's courses still comprise a range of media: text materials, television programmes, videos, audio material on cassette or CD, multimedia and other computer software on disk and CD-ROM, home experiment kits for practical work and, of course, increasing use of the Internet and World Wide Web. Although many Open University courses include opportunities for Internet use, only a few are currently 'Web-based' (i.e. use the WWW as the principal medium).

UK Open University Students

There is no such thing as a 'typical' student of the UK Open University, although there are a number of general statements that can be made about our diverse student body. About two-thirds of registered students are between 25 and 45 years of age (although many are younger and 3% are aged 65 or over). Across the university there are slightly more female than male students, although the proportions registered for particular courses varies. Nearly all students are part-time and about 80% remain in full-time employment throughout their studies. The proportion of students with physical disabilities is much higher than in 'conventional' UK higher education institutions. The university's awards are based upon a modular course structure, with courses typically representing either one-sixth of one-twelfth of a degree-level programme. Students undertake their studies independently, although each is allocated a tutor (associate lecturer) who grades and comments upon their assignments as well as providing study support. Most courses include a very limited amount of contact time, when groups can meet face-to-face with their tutor: a few courses (particularly at entry level) include a short residential component.

Adult learners enrol for study with the UK Open University for a wide variety of reasons. Many seek a qualification that will help them to advance in their chosen career or to move in a new direction. Others take courses that will help update and develop their vocational knowledge and skills. There are many for whom a significant motivation is to prove (to themselves and to others) that they are capable of successfully completing degree-level studies – this is particularly the case for those who do not possess the normal qualifications required for entrance to university. Yet others want to pursue subjects for which they have a great passion, but that may be in no way related to the extrinsic motivation of vocation or career.

The Changing Face of Higher Education

Nobody can deny that the nature of higher education is being transformed by developments in digitisation and the convergence of computing and telecommunications technologies. Firstly, media technologies are changing the ways in which distance education is conducted, enabling learners to receive and interact with educational materials and resources and to engage with teachers and peers in ways that previously may have been impossible. Secondly, universities and colleges that have traditionally served a predominantly full-time and on-campus student body are increasingly making use of media technologies to reach learners in a variety of settings – on campus, on another remote campus, at home or in some other location. Recent developments have included individual institutions making core elements of all their courses available on the WWW (see, for example, MIT, 2001) and the growth of global university consortia that offer transnational courses via the Internet (e.g. Global University Alliance, Universitas 21, etc.). The UK Open University, which has been offering courses internationally for many years, held the world's first international 'Virtual Graduation Ceremony' in March 2000. Communications systems are making it necessary for 'distance' to be redefined.

The Study Environment of Independent Learners

Independent learners, many of whom are home-based, undertake their studies in highly varied and complex circumstances that cannot fail to make an impact upon the educational process. For example, to read text-based materials, learners require a location in which they can be free from unnecessary distractions for extended periods of time. To watch a video or interact with materials on a CD-ROM requires access to domestic resources that might be shared with others in the household and involve negotiations about when the equipment can be used without interruption. If a course requires them to use resources that they do not already possess, how do they go about gaining access? In addition to all of these factors is the certainty that for most independent learners, studying does not have first call on their time and attention: most will have paid employment and/or domestic responsibilities that have higher priority. (For further discussion of the varying contexts for distance learners, see Kirkwood, 2000a and Kazmer, 2000). Circumstances can vary so much between the members of a community of heterogeneous independent learners. In comparison with classroom-based educational institutions, the UK Open University has far less control over *what* media resources are used by learners, as well as *when* and *how* they use them.

For many years, I and my colleagues have been undertaking investigations aimed at finding out more about how independent learners use media technologies in their studies. Do the technologies enhance or constrain their study habits or approaches to learning? What are their attitudes and preferences within their particular learning contexts, and do these change over time? How do independent learners reconcile any conflicts between their need for learning outcomes that enable them to gain qualifications and the teaching aims of academic staff? Course designers and developers need to consider these and similar questions in order to gain a better understanding of their independent learners.

Research on Independent Learners' Use of Media

The findings reported here are derived from research undertaken recently at the UK Open University (Kirkwood, 2000b). Quantitative data was attained from a postal questionnaire survey of 2,700 undergraduate students (sampled across all academic areas), while quantitative data was gathered from six group interview sessions held in various cities around the UK. All of the students approached for the research had completed at least one year of study with the university and had experience of using a range of media for teaching and learning. The following represents only a selection of the findings, but these are considered to of relevance to the wider distance education community.

Attitudes to Media and Motivation for Use

As already mentioned, UK Open University courses include a range of media-based materials: students like to engage with various media and appreciate the variety and flexibility that this allows. Responses were very positive (using a five-point scale from 'strongly agree' to 'strongly disagree') to the following attitude statements:- *I like the courses that I study to use a range of media* (34.7% = strongly agree; 40.1% = agree); *I make good use of all the course components – they all contribute to developing my understanding* (28.4% = strongly agree; 43.1% = agree) and *The audio and television elements really help bring the subject(s) I am studying to life* (23.9% = strongly agree; 43.5% = agree). Students also like to receive all of their materials at the start of each study year (which is currently not always the case), as it gives them greater control over what, where and when they study. Again, responses were very positive to these statements:- *I would prefer to receive all of the course materials (including programmes) at the start of the study year* (43.4% = strongly agree; 22.6% = agree) and *I would prefer to receive all course television programmes on video cassette rather than as broadcasts* (55.9% = strongly agree; 26.2% = agree).

Most independent learners are busy people and have a limited amount of time available for studying. In many cases, the time available is not sufficient for all of the course materials to be studied to the depth anticipated by the course designers. Students have to be selective to survive in the system, and the assessment requirements play a significant part in guiding learners' choices. While a small proportion of learners seem to study *only* what is essential for assessment purposes (*assignment focussed*), a much larger proportion confess that assignments do influence their study behaviour (*assignment conscious*). Only a relatively small proportion of respondents agreed with the statement:- *I only study what is essential for assessment purposes* (5.0% = strongly agree; 19.1% = agree), while many more identified with the statement *Although I try to study as much of the course material as possible, assignment deadlines determine what actually gets studied* (27.5% = strongly agree; 41.3% = agree).

Use of General Media Output in Support of Studies

Learners' consumption of general (or 'mainstream') media output tends to decrease as a result of the time they are devoting to their studies. About half of the respondents – both male and female – indicated that since becoming UK Open University students they watched fewer mainstream television programmes than previously. However, very many chose to watch general television broadcasts that were related to their studies (18.4% = frequently; 24.3% = quite often; 43.4% = occasionally). Respondents were more interested in viewing informative and educative television programme (e.g. news & current affairs, documentaries, history, plays & drama, etc.) than light entertainment (e.g. chat shows, quiz/games shows, variety shows, etc.). In addition, they use a range of general media to help them keep abreast of developments in the subjects they study. Very many refer to relevant printed sources (i.e. books, magazines, journals, etc.) on an occasional or regular basis, although a significant number are now looking on the Internet for relevant sources of up-dating information. There are, of course, differences in behaviour between the various discipline areas.

Preferences for Media in Relation to Independent Learning

On most UK Open University courses, students spend more time working with printed texts than with any other form of materials. Texts not only comprise the 'core' of the teaching and learning materials, often they are also used for 'Study Guides' which direct students in their use of other media and provide structure for their learning activities. So it is hardly surprising that printed texts almost always receive very high ratings when students are asked about how useful they find the various course components for their studies (a standard question in the university's annual *Courses Survey*). For certain courses, some other media components are rated at a similar high level – for example, audiocassettes in courses teaching foreign languages.

As part of the research being reported here, students were invited to rate each of the media components included in their current course in terms of it value as a learning resource. A five-point scale was used, from 5 = 'very good' to 2 = 'poor' and 1 = 'not applicable'. Because few media components were included in *all* of the courses being studied, the data was filtered to include only the ratings given by those who had used each component. Overall, students rated the components they were sent as part of their course materials (i.e. CD-ROMs, videocassettes, audiocassettes) more highly than those they had to access themselves in some other way (i.e. on-line communications, on-line resources, television and radio broadcasts). In numerical terms, between 80% and 90% of responses were either 'very good' or 'quite good' for the media components sent to students, while comparable ratings were less than 80% for the other media components. A subsequent question was very similar, asking students their opinions of how important – ideally – each component would be in UK Open University courses. Although there were some differences between the responses to the two questions, the components that were sent to students were again rated more highly than were those they had to access by some other means.

Understanding Learners' Attitudes and Preferences

Comments made by participants in the interview sessions help to develop an understanding of learners' attitudes and preferences. Many students appear to apply a form of cost-benefit analysis in order to determine which components of their courses are 'core' or 'essential' and which are not. A number of factors seem to influence the judgements made by learners. Some relate to intrinsic characteristics: media materials and resources are valued when they make a unique or distinctive contribution to the teaching and learning. Other factors are extrinsic: cues are derived from the ways in which they receive materials, and the advice and encouragement they get from tutors and peers. Patterns of behaviour and preferences developed during one study year very often influence learners' actions in subsequent years, as they cultivate a more strategic approach to coping with the many demands of studying independently.

In general, students prefer television material they receive on videocassette rather than via broadcasting. This is not just because they are easier to access (i.e. no problems with setting the video recorder correctly), but because the sequences are perceived as providing core content, an integral part of the course. In contrast, television programmes broadcast for the UK Open University are often seen as containing background or additional information that is interesting and useful, but not essential for successful completion of the course: "*... if it's essential they should have provided us with the tape*". Materials on CD-ROM are highly valued, particularly when they provide opportunities for learners to actively explore, manipulate and interact with resources and where these forms of engagement are central to the learning process. Learners' views of on-line resources and communication are similarly differentiated. Where these are perceived as well integrated in an educational sense (i.e. providing a core part of the syllabus), they are much valued and well used by learners. However, when they fulfil a more marginal role (e.g. added-on to an existing course), students are likely to be unimpressed with what they find and are doubtful about whether they will maintain the effort to log-on regularly. While many students are keen to extend their learning opportunities with information and communication technologies, there remains a questioning approach – the educational benefits must be apparent and worth the time and effort involved.

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Biographical Sketch

Adrian Kirkwood is Head of the Programme on Learner Use of Media in the Institute of Educational Technology at the UK Open University. For more than a decade, he has been monitoring and evaluating developments in media-based teaching and learning, both within the UK Open University and in other education and training organisations. These activities have resulted in a range of publications, and have provided the basis for a series of professional development workshops that have been run in a number of institutions in the UK and in other parts of the world.

Address: Institute of Educational Technology
The Open University, Walton Hall
Milton Keynes MK7 6AA, UK
E-mail: a.t.kirkwood@open.ac.uk
URL: http://iet.open.ac.uk/pp/a.t.kirkwood/adrian1.htm
Phone: +44 1908 652401
Fax: +44 1908 653744

Strategies for Effective Student/Student Interaction in Online Courses

Mary Ann Kolloff
Assistant Professor
Eastern Kentucky University

The relationship between teaching and learning requires instructors to design the learning environment, and students to manipulate and learn content and acquire knowledge. Within the transactional theory of communication, interaction must occur between the instructor and student(s) in order for a feedback loop to occur. Instructors provide feedback to the students, in the classical sense, by correcting errors. As the instructor identifies errors, it is assumed that students are engaged in active learning strategies whereby they recognize inadequacies in their mental models and are motivated to form a deeper understanding of the concept, skill, or attitude. Students provide feedback to the instructor by indicating their misconceptions and clarifications. In addition, the transactional model of communication must account for student-to-student interactions. As the paradigm for teaching and learning undergoes change from teacher-focused to a learning-focused paradigm, these student-to-student interactions are vital for building online learning communities that effectively support productive and satisfying learning interactions, and develop student problem-solving and critical thinking abilities. According to Romiszowski and Mason, "interactivity isn't inherent, but must be designed so that it is dependent on participation frequency, timely contributions by the members, and the nature of the messages posted. If students get behind they may find the medium to be didactic and passive" (1996, p. 445).

The transactional communication model is consistent with Michael Moore's concept of "transactional distance". Moore includes interaction between learner-instructor, learner-content, and learner-learner. It is the intent of this paper to focus on this learner-learner interaction and the instructor's design strategies for effective student/student interactions in online courses. For the purpose of this paper, learner-learner interaction is defined as the communication, exchange, and support among students about the course content, information, documents, and assignments.

Roles of Online Instructors

Goodyear, Salmon, Spector, Steeples, and Tickner (2001) identified eight different roles for online teachers. These roles described the online teacher as the (a) process facilitator, (b) adviser-counselor, (c) assessor, (d) researcher, (e) content facilitator, (f) technologist, (g) designer, and (h) manager-administrator. The roles of designer and process facilitator are of particular concern when designing and implementing an online course meant to engage students in student-student interactions. The design role was defined as a pre-course activity "concerned with designing worthwhile online learning tasks", and the process facilitator role as an in-course activity "concerned with facilitating the range of online activities that are supportive of student learning" (p. 69). The design role becomes important in that the majority of the instructor's time is spent in determining how the course is to be implemented. The design of the content, consistent with the learner-focused paradigm, shifts from "teacher initiative, control and responsibility to shared initiative, control, and responsibility" (Reigeluth, 1999, p. 19). Indeed, the teacher becomes the "guide on the side" instead of a "sage on the stage." Thus, the instructor is not positioned in the center of the online communication, but as a supporter of students in their learning. This means moving to an inquiry-based educational approach.

Framework

As instructors assume the role of the "guide on the side" and avoid becoming overwhelmed with online teaching, they need a process to follow in order to construct well-designed resources for students. It is up to the instructor to construct situations, within the resources, that promote student-to-student interaction in order to produce a successful learning community. Often the student-to-student interactions in online courses are rather informal and/or without specific guidelines. As a result, it is necessary to develop and/or refine strategies to ensure productive interactive situations between students. Effective interaction will assist in the establishment of a learning community, stimulate interest, create activity, engage the student, and allow interaction with the information. Such a process for planning and/or analyzing student-student interactions can be based on Reigeluth's (1999) comparison framework for thinking about different theories of instruction. It provides for implementing a variety of instructional theories, including various kinds of learning whether cognitive, affective, or motor. Specifically, these criteria are: types of learning, control of learning, focus of learning, grouping for learning, interaction for learning, and support for learning. An additional category, online discussion technique, is added to clarify the computer conferencing tool implemented.

Working Through the Process With the Framework

The following addresses each criterion by providing example questions that an instructor should ask in designing and analyzing learning activities for student-student interaction.

➢Type of Learning
❑ What is the purpose of the learning activity and the type of learning activity involved?
❑ What learning theory does the activity address?
- Does it address such theories as behaviorism, cognitivism, constructivism, or social learning theory?
- Does the learning activity address an overlapping of theories?

❑ What type of learning activity is involved?
- Is it memorizing information, understanding relationships, applying skills?

❑ What is the relationship between building knowledge and applying critical thinking or problem-solving?
- Is the activity requiring the students to engage in both knowledge building and critical thinking?

➢Control of Learning
❑ Who controls the learning process?
- Is it the instructor, student, instructional designer, or standardized tests?
- Does the instructor, students, or both select the content, goals for the course, resources, and activities?
- Does the instructor, and/or students, or both evaluate the learning?

➢Focus of Learning
❑ How will the instructor focus the learning activities?
❑ Will the learning activities center on a topic or a problem?
❑ Does the instructor want the learning activity to be specific to the domain or is it interdisciplinary?

➢Grouping for Learning
❑ Is the learning activity an individual project or should there be collaborative groups?
❑ If there are collaborative groups, should there be pairs, teams, or small groups?

➢Interactions for Learning

- ☐ What is the primary student interaction desired by the instructor?
- ☐ How should the students use each other for support and as resources?
- ☐ How should the students interact with the instructor?
- ☐ How should students interact with content information and resources such as the web, audio, video, hands-on tools, print, or experts in the field?

➢Support for Learning

- ☐ How can the emotional support for the learning be given?
  - How can the instructor support the students' attitudes and motivations for taking the course?
  - How can support be given for providing students self-confidence in tackling the technology, understanding the content, and minimizing the general frustration level?
- ☐ How will cognitive support for learning be given?
  - How can support be given that reinforces appropriate responses or performances or corrects and directs the behavior?
  - How can support be given so students change their perceptions of the content?
  - How can support be given so students are engaged in the cognitive demands of the content?
  - How can support be given so concepts are clarified and ideas are transferred to new or modified conceptual frameworks?

➢Online Discussion Technique

- ☐ Should the discussion technique include synchronous (live) or asynchronous (anytime, anywhere) communication?
- ☐ What mode is ideally required by the particular learning activity?
- ☐ If synchronous mode of communication is used, will the software allow for the number of students enrolled in the course?
- ☐ If asynchronous communication is used, how will the instructor control the discourse?
  - How will the instructor control the conversation as it drifts off the topic?
  - How will the instructor know who is contributing and participating in the conversations?
  - How can the instructor draw those students lurking in the background into the conversation?
  - What if the conversations occur over a 3-4 week period of time?
  - How does the instructor provide appropriate feedback?

An Example

The following is an example of the application of the process and framework to an assignment that includes activities that prepare students for their interactive experiences.

Assignment for the Genome Project

This discussion will occur over a three (3) week time period. Read the two articles about the Genome Project. The question is: What impact will the Genome Project have on collection development, public relations, and programming in your high school media center? The class will be divided into small groups.

Applying the Process and Framework

➢Type of Learning

- The purpose of the learning activity is to build knowledge and application of relationships of the role of the library media center to the social, ethical, legal, business and technology issues involved in the topic.
- The cognitive learning theory is addressed because the nature of the task is for learners to share information, ideas, and opinions or beliefs concerning the implications of the human genome project to collection development, public relations, and programming for the high school media center.

➢Control of Learning

- In this example there is a mixture of the instructor and the students controlling the learning process. The instructor has selected the topic and content concerning the organization and administration of a school media center. The students control the learning process since they have to construct a plan associated with the implications for the high school media center in the areas of collection development, public relations, and programming.
- Both the instructor and students evaluate the learning process. The instructor will provide appropriate responses needed to correct and direct the students' performances. The students will provide evaluations of the information they share with other students in the small groups, and from the whole group when they present their overall plan.

➢Focus of Learning

- The learning activities center on a topic, the human genome project, and the problem within organization and administration of high school library media centers.
- This specific learning activity is specific to the domain of library media centers as well as being interdisciplinary in that it has implications for various content areas in the high school curriculum such as math, science, and technology.

➢Grouping for Learning

- The learning activity is collaborative. Collaborative groups will be assigned a topic area of collection development, public relations, or programming.
- The collaborative groups will consist of small groups, i.e., 3-6 members per group.

➢Interactions for Learning

- The primary interaction wanted in this assignment is student-to-student.
- The students use each other as resources and for support by commenting on the information they collect from various information resources, observations and experiences, and each other. In addition, as the small groups present the information to the whole group, comments from the whole group will expand their perspective they provide questions to determine why the particular plans were framed in a particular manner.
- The students should interact with the instructor to clarify any questions about the assignment. The instructor also needs to provide guidance and direction associated with the appropriateness of the developing plan.

➢Support for Learning

- The motivation involved in this learning activity is based in reality thus providing a relevant learning experience for the future library media specialists. In addition, the instructor can provide opportunities for students to ask questions regarding clarification of the assignment and review guidelines. The instructor can also provide opportunities for other students to indicate their understanding of the assignment.
- The instructor provides cognitive support for learning by participating in the small groups with the students as they begin to gather information sources, ideas, and opinions within their small group. The instructor provides corrective and direct feedback. The instructor, interacting in small groups, provides guidance enabling the students to recognize alternative ways that the organizational and administrative topics may be conceptualized. In this manner, the students can practice generating alternative interpretations involved in solving problems in the task.

➢Online Discussion Technique

- The small group members may decide upon the discussion technique for their interaction. It may be synchronous or asynchronous (anytime, anywhere), or both types of communication depending on the demands of the participants schedules.
- The final presentation of the small groups may be in a synchronous chat session so that the whole group may share observations and elaborate upon the ideas presented in the plan. This particular assignment will occur over a 3-4 week period of time. The instructor will have to structure times for synchronous sessions with each small group or provide a date and time for providing feedback focusing on the appropriateness of the developing plan. The instructor will also want to provide guidance to the students relating to closure to the project. For example, the students may need guidance determining when they have located enough resources and synthesized the information into their final product.

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Biographical Sketch

Dr. MaryAnn Kolloff is an assistant professor in the Department of Curriculum and Instruction at Eastern Kentucky University (EKU). Her responsibilities include teaching technology and literature courses for library science graduate students. She teaches using ITV and web-based instruction. She received her Ed.D. in Instructional Systems Technology from Indiana University; Ed.S. in Instructional Systems Technology from Indiana University; M.Ed. in Special Education from National-Lewis University; and B.S. in Child Development and Family Life from Northern Illinois University.

Address: Department of Curriculum and Instruction
521 Lancaster Ave.
Eastern Kentucky University
Richmond, KY 40475
E-mail: maryann.kolloff@eku.edu
URL: www.curriculum.eku.edu/faculty/kolloff
Phone: (859) 622-8086
Fax: (859) 622-2004

"Soft Skills" From a Distance

Michael A. Konopka, D.A.C.C.E.
Professor, Sustaining Base Leadership and Management
Army Management Staff College

Mary-Blair Dupré, D.P.A.
Professor, Sustaining Base Leadership and Management
Army Management Staff College

If you went to your computer, selected your favorite search engine, and then typed in "soft skills" as your subject to search, the variety of definitions or perceptions of what the term means would overwhelm you. One site refers to them as "inter-personal skills," while another site lists topics like "leadership, communications, self-confidence, and self-awareness." What the sites have in common is that they all know that the subjects are not "hard skills" like technical competence, time-management, goal setting, management, marketing, and so on. They also agree that while it is difficult, it is not impossible to do "soft skill" development in non-traditional, non-face-to-face settings. In fact, there may actually be real advantages to doing it "from a distance."

As teachers, we tend to focus on the content aspect of the subject, English 101, Physics 307, Accounting 226, and so on, but as educators; we realize the criticality of developing the whole student. When we say soft skills, we are talking about all of those skills that help the student develop--in the broad sense, everything from thinking, to communicating, to awareness of behaviors, to the umbrella of being an effective contributor to any environment. But how do we do it—help students develop their "soft skills"?

Introduction

The Army Management Staff College offers a mid-career leadership development program for primarily mid- to upper-level civilian employees of the U.S. Army in both a 12-week resident mode and a yearlong nonresident mode. Early in the resident program's development, we actually taught leadership, management, and decision-making—more content focused than development focused. Although we provided some activities with feedback, they were limited and did not always provide students with the opportunity to transfer these experiences to their own environment. Today, the program's focus is less on teaching leadership than on growing leaders. Within every hard skill there is a content-focused portion where the theory and principles are paramount. The "soft skills" require the same content core but they need coaching, feedback, inter-face, and development over time and across a range of contextual settings. In fact, the curriculum's focus has evolved from primarily content to a focus of developing these soft skills across a wide range of content. How in the world could that be accomplished with students spread from the Middle East and Europe, through almost all of the 50 states, and on to Thailand and Korea?

In the beginning stages of the nonresident format, it was easy to convert the lesson syllabi one-for-one first to paper and then to page-turner, web-based offerings. The current nonresident program has evolved over the past 5-6 years along with the strides made in technology. There are now various types of computer-mediated conferencing (CMC) platforms available. The incorporation of these platforms has helped the College provide the possibility of creating a highly interactive learning environment marked with ample opportunities to develop "soft skills."

The incorporation of these CMC platforms also provided the possibility for team requirements/team learning. In the process of monitoring the team learning experiences, the faculty soon realized that it provided them with the opportunity to observe the student's process as well as the end product. This gave the faculty greater confidence in determining which students were actually completing the work and ultimately, how the team members were working together. This recognition gave rise to numerous creative opportunities for "soft skill" development. The next questions were what else could we see, how could we expand our ability to observe other behaviors, and how could we help the students maximize the potential of these platforms?

Now that the possibility existed to observe these skills, the possibility also existed to provide feedback and assist development. With this, came the necessity to define those skills that could be observed. The faculty used a matrix for each piece of the curriculum that matched the learning objectives with the behavioral competencies also desired as outcomes.

Background

The nonresident program at the Army Management Staff College started in 1995 with boxes and boxes of books and syllabi being shipped to students all over the world 4 times during the school year. The students wrote papers and mailed them to the college for grading. The faculty took out their red pens and marked the papers and mailed them back. In the ensuing years, the program was first enhanced with e-mail and then with an internet-based proprietary classroom (chat-room) and limited video teleconferencing. More recent augmentations include an asynchronous collaborative learning area for threaded discussions on assigned topics and student-generated discussions on the curriculum or on the difficulties of distance education in general. The syllabi also evolved from paper- to web-based and assignments are submitted by e-mail, graded on screen, and returned electronically.

With each technological advance, the faculty had to address its own learning curve (regarding the efficient, effective, and appropriate use of the new capability), as well as teach the students how to use it to their best benefit. With a student population of mostly 40-somethings, chat and threaded discussion were almost like a foreign language, and replacing the card catalog with websites was equally disconcerting to many.

As the technology and learning methodologies evolved, so did the student evaluation experiences. In fact, the focus of the faculty turned to developing complex requirements that reflected assignments being completed, intellectual responsibility, and "soft skill" development. The CMC enhancements had taken the curriculum from the early years, that were marked with standard papers and quizzes taken largely from the resident program, to evaluations that include more student interaction. The evaluations now include on-line discussions, phone conferences, informal and even formal debates modified to be conducted asynchronously, students teaching some of what they have learned to their co-workers, interviews with organization officials, and workplace surveys, just to name a few. In addition, nearly half of these requirements are entirely completed as a team, requiring that the students make sense out of the theory first and lastly, that they hot wash their process as a team.

Developing, Observing, Evaluating and Providing Feedback on "Soft Skills" From Afar

The nonresident faculty at the Army Management Staff College made a conscious decision that the students were going to have to accept responsibility for "getting it" in terms of the actual program content. The evaluations would ensure that reading and discussing the material was necessary, but beyond that the faculty decided to focus on the things that they could not physically observe about their students scattered all over the globe. Since the primary focus of the College is leader development for the civilian managers of the Army, the faculty determined that the "soft skill" areas were as critical, if not more important, than for example, how the Army budget gets approved.

The students are encouraged and even expected to create understanding of the material and the process of learning together while providing feedback to each other on individual behaviors as they work through the process. There is virtually no regurgitation of facts, but the teams make sense out of what the material means to their own individual work environments and they reflect on the team aspects of uncovering that meaning together. Providing meaningful feedback on behaviors requires that trust be built so people can accept the feedback. With all the discussion captured in logs, exemplifying behaviors is quite easy--and certainly undeniable.

The students come from various functional areas and are expected to apply models and teach one another in their respective areas of expertise. In some cases they conduct research on a problem or issue in their own organization, using other members of the team to provide alternate perspectives. They conduct asynchronous discussions applying Socratic-type principles on a regular basis. When they are in the final months of the program, they are even designing their own plan for how they propose to show the faculty what they have learned. All of these variations contribute to the overall development of the student.

Advantages for the Development of "Soft Skills" in Absentia

There are several distinct pluses for the virtual classroom in terms of "soft skills." One is that there is more time for the students to formulate their thoughts. Granted there is a lot to be said for thinking on one's feet and responding to a question cold, but for leadership development, there are things that take precedence over that. Students preparing for an asynchronous discussion have time to work through issues carefully and to summarize and synthesize what they will "say" via their keyboard – it is hard to blurt out unformulated thoughts when typing.

Secondly, a traditional classroom student might be physically in the room and marked "present," but be lost in thought or otherwise detached from the discussion swirling about. The silent or absent nonresident student is noticed and group norms generally provide for his/her inclusion by asking the student to recap or weave the discussion to that point. This helps clarify an absent member's understanding for the group. This is essential when the product for grading is a team effort. That, in itself, is another advantage – all share in the leadership of the team and all have a vested interest in the outcomes of teamwork.

Finally, to reiterate the advantage of logs for both synchronous and asynchronous sessions: this means faculty can easily provide feedback and exemplify with specificity for both content and process. In the traditional classroom, many fleeting interactions may never be addressed once the moment has passed and the dialog not captured on the spot for comment.

It would be difficult in a paper of this length to cover all the things that are possible, but perhaps some of these will whet your appetite and spark your own creativity concerning observing "soft skill" development from afar. The skill sets that the Army Management Staff College focuses on are team building and maintenance, leadership (which includes communications, decision-making, and critical thinking), self-awareness of learning processes and outcomes, collaboration and consensus building, and analysis and synthesis. In addition, emphasis is placed on an overlapping set of core competencies (identified by the U.S. Office of Personnel Management for executive development) on which the College consistently focuses. They are Leading Change, Leading People, being Results Driven, having Business Acumen, Building Coalitions, and Communication. (OPM, Jan, 1998)

Examples of some of the ways these are done are as follows:

- Although the nonresident program is set predominantly in distance learning mode, there are two weeklong resident sessions built into the program--one at the start and one at the end of the yearlong program. The entire focus of the first week's methodology is teambuilding and team development. Without the ability to trust one another completely, the teamwork expected from these students is not likely to occur. The faculty considers it essential to facilitate and encourage a high degree of bonding during orientation. These key interactions help sustain the seminar for the remainder of the year. The College is fortunate that the students get to meet face-to-face for a brief period of time as this helps in the establishment of the "learning community." Palloff and Pratt (1999) posit that "In distance education, attention needs to be paid to the developing sense of community within the group of participants in order for the learning process to be successful" (p. 29).

- Once back at their normal work environments, students use synchronous and asynchronous modalities for completing their team projects – the backbone of the "observable" teamwork that will take place throughout the year. They go through the stages of storming and norming like any other team. Their interaction, spanning up to eight time zones, is captured in logs and is available for review and assessment of the process as well as the content of the discussion. The faculty can therefore provide feedback on the "soft skills" of virtual team building.

- In an article on "Improving Learning Outcomes" Olgren (1998) discusses the need for knowledge of self, the learning task, and how one learns under varying conditions. Towards that end, the College has students complete a full battery of assessments of their personality preferences, leadership behaviors, learning styles, and so forth. The results enable them to be aware of their own needs and preferred ways for organizing their individual studies and team efforts. They learn about their strengths and weaknesses and how to apply that knowledge to their assignments and to their on-the-job performance. They become very aware of the "soft skills" involved in effective learning.

- Nonresident students also work full time. This gives them the opportunity, not available to resident students, to immediately apply the things they have learned in an actual work environment. It also means that they have to learn to prioritize their workload and manage their time effectively and efficiently. Frequently they are encouraged or even required to share some of their learning with office mates and hence practice "soft skill" development in communication and collaboration.

- Almost all of the requirements for the program require at least the preparatory work, if not the entire product, to be done in small groups. Olgren (1998) states that the student must have "the ability to plan and regulate the learning process" (p. 82). The students, therefore, have to organize themselves into efficient teams based on expertise, schedules, and so on, and select a methodology that best supports the requirement. They then have the option of using a variety of computer mediated conferencing. This kind of teamwork would probably not happen automatically without the insistence from the faculty that groups will be used. Students are expected to deal with recalcitrant team members, laggards, virtual collaboration, disagreements, varying interpretations of the assignments, and so forth.

- Argyris (1992) stated that it is difficult to teach smart people how to learn because many professionals are successful and have rarely experienced failure. "And because they have rarely failed, they have never learned how to learn from failure" (p. 85). So when failure occurs, they become defensive, don't listen to criticism, and blame everything and everyone but themselves. Knowing this, the College built into the curriculum not only faculty-to-student feedback but student-to-student mechanisms and self-reflection and evaluation as well.

Summary

The Army Management Staff College's leadership development program has a set of building blocks for "soft skill development" embedded in every aspect of the program's curriculum. By focusing the students on the requirements and what they are to do and how they are to do it, the content gets covered and the students develop skill sets in a number of areas that are important for personal and professional enhancement. The students learn and the faculty can evaluate their ability to think, solve problems, make decisions, collaborate, build teams, and ultimately to learn.

What started for the nonresident program at the Army Management Staff College as a search for evaluation methodologies more appropriate to the distance learner, turned into a full-scale re-orientation of the curriculum. By focusing on the requirements and the skill sets, including "soft skills," the students gain competencies not only in the knowledge of how the Army runs, but also in behaviors and skills that are necessary in the fast-paced and resource-constrained workplaces of this new century.

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Biographical Sketches

Michael A. Konopka has spent nearly 20 years as an educator at the college level, counseling adult students, and developing curriculum for adults. He currently teaches and develops curriculum in the distance education program at AMSC. Dr. Konopka currently holds a BS in Business Administration from Gannon University, a MS in Systems Management from the University of Southern California and a Doctor of Arts in Community College Education (DACCE) from George Mason University.

Address: Army Management Staff College
5500 21st Street, Suite 1206
Fort Belvoir, VA 22060-5934
E-mail: mike.konopka@amsc.belvoir.army.mil
Phone: (703) 805-4742
Fax: (703) 805-2224

Mary-Blair Dupré has taught for over 30 years and to all ages from pre-school to senior citizens. She has 7 years experience in distance education at AMSC. Dr. Dupré has a BA in English Education from Ohio University (1970), an MPA (Public Administration) from the University of West Florida (1982), and a DPA from George Mason University (1993).

Address: Army Management Staff College
5500 21st Street, Suite 1206
Fort Belvoir, VA 22060-5934
E-mail: mary-blair.dupre@amsc.belvoir.army.mil
Phone: (703) 805-3146
Fax: (703) 805-2224

Student Enrichment Program for Distance Learners

Adrianna Lancaster, Ph.D
Associate Director
Center for Distance Education
University of Texas at Arlington

Trish Nickel, MA
Instructional Designer
Center for Distance Education
University of Texas at Arlington

Learning Communities

Education involves more than the provision of information – it is an interactive process. Successful learning is embedded in learning communities which support and stimulate students through collaboration and shared experience; ultimately resulting in socialization into the broader professional community. In higher education this has traditionally taken the form of student organizations, student-faculty research projects, mentor relationships, guest lecturers, and shared space. As distance education has proliferated, the space where students learn and create community has changed

The Student

Stephen Acker (2001), in his discussion of the changing demographics of university enrollment, reported the following:

> Maria Williams-Hawkins describes the new "traditional student" as between the ages of 25-32, citing National Center for Education statistics that about 43% of all current college students are at least 25 years old. The majority of these new students are women, and many of them assume primary responsibility for children and/or elderly dependents (1994). In addition, many are employed full-time and are returning to acquire specific job-related skills. They are in school to advance their careers. (1991)

This demographic is especially well suited for the time independent environment offered by distance education. While many distance education students are adult learners, whose focus is primarily on course work rather than on-campus activities, it is essential that they be offered the opportunity to benefit from involvement in the educational community that exists within their program/discipline.

Community Creation

The "traditional college experience" in contrast to distance education, had included on-campus activities such as joining student organizations, campus intramurals, research projects and building long-lasting relationships with fellow students and faculty mentors. However, as the conception of "traditional" education changes, so must the conception of the "traditional college experience." While it is generally accepted in higher education that distance education is no longer an aberration, it is not yet widely accepted that these programs offer the same opportunities for the creation of a community of learners as on-campus programs do.

Critics of distance education programs often emphasize that students who do not visit the physical campus are denied the ancillary elements that have traditionally defined the college experience and they are therefore isolated. The assumption is that community can only exist in one type of space: the physical campus. Distance education rejects this assumption.

Distance Education's Capacity to Create Community

Distance education may actually have a greater capacity for building an inclusive community of learners. On the physical campus, the creation of a community of learners is time and space dependent, therefore including only those learners who are not restricted by time and distance. Distance education, on the other hand, is able to provide community independent of time and space.

Traditional	Distance
Meetings on the physical campus; time specified	Meetings by email and discussion boards; time independent.
Meeting with professors during their office hours on the physical campus.	Meetings with professors by email and discussion boards; time independent.
Building of relationships with fellow students limited to time on the physical campus; usually limited to small groups of people.	Building of relationships with fellow students by email and discussion boards; potential to include more students.
Research initiatives available to students who are able to work with the professor on campus.	Research initiatives available to all students who are interested.
Student government takes place on campus.	Student government takes place online.
Guest lectures on campus; limited time to ask questions.	Guest lectures online; question period extended; archived for those students unable to attend at specified time.

A Model for Implementation

To date, efforts at creating a program that provides enrichment activities beyond the classroom have remained limited. There is no existing model of a comprehensive online student enrichment program. The Center for Distance Education at the University of Texas at Arlington has developed a model, titled the Student Enrichment Program (SEP), to be implemented with a Criminology and Criminal Justice degree completion program. With the involvement of the CDE and CRCJ faculty, the SEP will engage CRCJ students in an online educational community.

Project Goal

The goal of the SEP is to create online enrichment opportunities for distance education students through creation of an online campus community.

Audience

The SEP audience will include students enrolled in the Criminology and Criminal Justice degree completion program. The program will begin in the same semester as the CRCJ degree completion program, allowing for simultaneous initiation of the CRCJ and SEP programs. Additionally, it is expected that the CRCJ students, because of their shared academic program and professional interests, will respond well to the community environment of the SEP.

Student Enrichment Program Elements

Web Page: The SEP will be centralized in a web page with links to Newsletters, Related Links, FAQ's, Archives of Guest Lectures, Links to Student and Faculty Web Pages and E-mail, and other elements. The SEP page will also be linked to CRCJ program information pages.

Welcome Packet: The welcome packet will include: welcome letters from the CRCJ Department Chairs and participating UT System Centers for Distance Education, a program T-shirt designed by the UTA CDE, a mouse pad designed by the UTA CDE, a CD containing necessary software, logo pencils and highlighters, and an introductory newsletter.

Newsletter: CDE will publish a Fall and Spring newsletter, covering Criminal Justice, Criminology, and Distance Education news. The newsletter will be distributed to students, faculty and staff by mail and the Internet. The introductory newsletter will invite students, faculty and staff to submit their own contributions as well.

Guest Lecture Series: In the Fall and Spring semesters the SEP will host a guest lecturer from the field of CRCJ. The lecture will be web cast, allowing students to ask questions for a pre-determined amount of time. For those students unable to view the lecture live, it will be archived and available on the SEP web page.

Center for Criminal Justice Research and Training: Through the SEP students in the online CRCJ program will have an opportunity to be involved with UTA's Center for Criminal Justice Research and Training. Established in 1977, the main purpose of the Center is to provide assistance to criminal justice agencies, governmental institutions and citizen groups concerned with the administration and operation of the criminal justice system. Additionally, the Center is developing a dynamic online resource and information web page, which will provide students with access to research and career guidance specific to Criminology and Criminal Justice.

WebBoard Discussion: Students and faculty will have an opportunity to discuss program-related, academic, and career issues on the SEP WebBoard.

The above-mentioned elements will be included in the first year of SEP. The CDE at UTA will conduct an evaluation, including an online focus group among participants, in order to determine student interest in further expansion of the SEP to include elements such as E-Mentors, an Electronic Honor Society, Student Congress, and other ideas proposed by students, faculty and staff. Additionally, students, CRCJ faculty and CDE faculty and Staff will evaluate their experience in the SEP. Based on these evaluations the SEP could be expanded to other distance education programs.

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Biographical Sketches

Adrianna Lancaster is the Associate Director of the Center for Distance Education at the University of Texas at Arlington.

Address: Box 19027
Arlington, TX 76016
Phone: (817) 272-5727
E-mail: adrianna@distance.uta.edu

Trish Nickel is an Instructional Designer in the Center for Distance Education at the University of Texas at Arlington.

Address: Box 19027
Arlington, TX 76016
Phone: (817) 272-5727
E-mail: adrianna@distance.uta.edu

Supporting Learners in Distance: Results of Benchmarking Support Services in Leading Distance Education Programs

Ji-Yeon Lee
Ph. D. Candidate
Indiana University

Minhee Kim
Doctoral Student
Indiana University

The needs for learner support in distance education comes from the recognition that learning in distance is often mediated by networked computers with individualistic interfaces that require learners to work alone for the majority of learning process. Since neither the instructor nor their peers are physically present to help and direct access to learning resources and facilities are somewhat limited, distance learners have unique needs, and many researchers and practitioners believe that providing distance learners appropriate support services would increase the quality of learning (Feasley, 1983; Gunawardena, 1988; Sahoo, 1993). Thus, it is not surprising that learner support is used as an important accrediting criterion by most accrediting agencies (The Institute for Higher Education Policy, 2000; Broad, 1999; Mantyla & Gividen, 2000).

As more and more post-secondary institutions are offering distance education programs or planning to do so in the near future[1], there is a great need for research on designing and implementing learner support services. However, the majority of existing studies on learner support are based on large-scale correspondence programs (i.e. Open University in U.K.), and few of them provide a comprehensive analysis of support services in web-based environments or guidelines for establishing and managing learner support systems in dual-mode institutions (Koble & Bunker, 1997; Simonson, Schlosser, & Hanson, 1999).

In this study, we analyzed the types of support services available for distance learners in 30 leading distance education programs in United States, Canada, United Kingdom, and Australia. The data were collected through web documents analysis, web survey, and phone interviews. Based on our analysis of data and review of the literature, we suggest seven categories of distance learner support services to ensure successful learning for all distance learners. These services include academic support, administrative support, counseling support, financial support, library support, support for students with special needs, and technical support.

Definition of Learner Support

Defining the key elements and boundaries of learner support is important in research since it provides a criterion in determining the standard or quality of learner support. However, learner support is rather a broad concept and its definition varies (Robinson, 1995; Sewart, 1993). Some researchers consider resources and interactivity as critical in defining learner support (Garrison, 1987) while others put more emphasis on individualization or customization of services (Tait, 1995).

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[1] According to a 1999 survey by the National Center for Educational Statistics (NCES), nearly 1/3 of all 2-year and 4-year postsecondary institutions offered distance courses in 1997-98, and additional twenty percent of them were planning to offer distance courses within three years.

There are two distinctive views to approach learner support – supplementary and complementary/holistic (Robinson, 1995; Tait, 1995; Nunan, 1993). The former is more limited in that learner support is confined as an add-on to course materials or other learning experiences while the latter view it as a crucial factor which pervades the entire education program and something without which distance students' learning experience cannot be complete. It seems that more and more researchers are taking a holistic approach considering learner support as an integrated part of course and the entire learning process (Sache & Mark, 2000; Scalzo, Matela-Rodier, & Ferrauilo, 2000). From complementary perspective, learner support is all about providing access to both resources and opportunities that leads to lifelong learning (Reid, 1995). It extends the range and duration of services and emphasizes the importance of providing quality information, advice and guidance at pre-enrollment and early post-enrollment stages. Hardy & Boaz (1997) even extend the concept of learner support into the next level – "learner development" meaning preparation of the learners for a distance learning experience beyond the technical assistance.

Elements of Learner Support

There is an almost infinite variation in learner support systems in distance education, and as Sewart (1993) commented, each system is unique in a sense that it is dealing with a different student population in a different context. Thus developing a general yet representative framework of learner support has been a challenging task for researchers in this area. One of the most comprehensive lists of elements of such a system was developed by Keast (Keast, 1997). He identified four distinctive types of support for distance learners - administrative support, instructional support, technical support, and counseling/tutorial support. This list is by no means exhaustive and misses library support, a very important category that is gaining growing attentions these days. Each category is further elaborated in the following section, and considering the special relevance to current emphasis on informational technology and accessibility for all learners, library support and support for students with special needs as well as academic support were added to Keast's four elements of learner support system.

Academic/Tutorial Support

Academic/tutorial support is largely based on Open University model in U.K. where students have access to local study centers and tutors who supervise their academic progress and help with problems (Sahoo, 1993). In more recent web-based distance education programs, the focus of academic support gears toward facilitating collaborative learning and increasing interactivity between distance students and instructor or among distance students. Some of the examples of such services include syndicate or learning groups, support by instructor on request, workshops to assist students to develop specific skills or bridge skill gaps, supervision support on research project, and "learning contract" and scheduling.

Administrative Support

Administrative support services involve maintaining basic program functions such as admissions, registration, course scheduling, student records, and financial transactions (Frieden, 1999). These services are often taken granted but when not planned carefully, they cause greatest frustration from distance students.

Counseling Support

Counseling support includes various aspects of guidance and advising. In correspondence studies or other delivery medium with more individualistic interface, the focus of such services tends to be focused on how to deal with academic concerns and/or career advising. In many web-based distance education programs, counseling support also deals with ways to improve communication skills and increase interactivity, and even network with alumni and community building.

Many institutions are also requiring orientation sessions that bring the students on campus in order to familiarize them with the services that are available. Such sessions would provide an opportunity to learn the interfaces used to access the services as well as a chance to interact with the support personnel on-campus.

Financial Support

Higher than average drop-out rates for students taking online courses have been a serious concern for many researchers and practitioners in the field and many believe that providing financial support would enhance the student retention in distance education programs. In the past, distance students have been hampered in receiving financial aid because of a number of provisions in the federal Higher Education Act. However, the government will waive some of the rules and encourage institutions to provide more financial aid available to students pursuing college degrees through online programs (Chronicle of Higher Education, 2001).

Library Support

Access to adequate library services and resources is essential for the attainment of superior academic skills in post-secondary education and distance learners are entitled to library services and resources equivalent to those provided for students in traditional campus settings. However, traditional on-campus library services often fail to stretch themselves to meet the library needs of distance students. The Association of College and Research Libraries (1998) provides a guideline for distance education programs to ensure that library support meet the students' needs in fulfilling course assignments (e.g. required and supplemental readings) and accommodate other information needs as appropriate. Some of the specific examples of library services to meet those needs include region-wide borrowers cards, consortia membership between academic libraries, and fax and online capabilities for the timely document delivery.

In a review of the literature on distance learning library support, Stephens (Stephens, 1996) stressed that what was lacking was not only books and journals per se, but instruction and the opportunity to do independent library research. To be able to fill this gap, distance library services need to be more customized and empowering distance learners, such as providing toll-free telephone numbers for library help desk and capabilities to use multiple databases and online public access catalog. The combination of special funding arrangements, proactive planning, and promotion is necessary to provide such services.

Support for Students With Special Needs

Institutions offering online degree programs are increasingly aware of the importance of diversity in web learning environments and ensuring access for all students becomes critical in nowadays. For example, the Americans with Disabilities Act (ADA) of 1990 requires reasonable "modifications to course materials or activities that serve to enable a qualified student with a disability to have an equal opportunity to attain the same level of performance as a similarly qualified student without a disability (Hinn, 1999)." To comply this requirement, many distance education programs provide services such as note-taking as well as specialist equipment or transportation arrangements.

As more and more distance education programs attract students from abroad, there is a need for language assistance for non-English speaking students. Some programs are offering both web and paper brochures in different languages, as well as English tutorial services.

Technical Support

Technical support refers to monitoring efficient operation of delivery mediums and offering technical assistance. While much research has been conducted on the use of new technologies in designing and developing distance courses, less effort has been directed toward the use of new technologies to provide support services for such courses (Abate, 1999). Providing an 800 telephone number for students to contact the faculty and staff, requiring that all students have access to email and know how to use it, requiring faculty to schedule office hours particularly for distance students at times that would be convenient to the students, and it may be necessary to devote additional on-campus facilities to support the off-campus population.

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Biographical Sketches

Ji-Yeon Lee is Ph.D. Candidate of Instructional Systems Technology at Indiana University. She is a School of Education Chancellor's Fellow and has made presentations at conferences of American Educational Research Association (AERA), Association of Educational Communications and Technology (AECT), and the Annual Conference on Distance Teaching & Learning. Her dissertation topic is about identifying expertise in designing Web-based Instruction (WBI). Her areas of interest include learner support in distance education, online collaborative learning, distance education program evaluation, and faculty buy-in in distance education.

Address: Evermann APT. 347
Bloomington, IN 47408
E-mail: leej@indiana.edu
URL: http://php.indiana.edu/~leej/
Phone: (812) 857-7501

Minhee Kim is doctoral student of Instructional Systems Technology (IST) at Indiana University. She is a project assistant at International Programs and Center for the Study of Global Change, an Indiana University Affiliated Institute, and she also works for CourseShare.com as a consultant. She has worked for the Korea National Open University (KNOU) and organized online learning workshops for the faculty members of KNOU.

Address: Evermann APT. 345
Bloomington, IN 47408
E-mail: kimminh@indiana.edu
URL: http://php.indiana.edu/~kimminh/
Phone: (812) 857-8687

Designing Online Animated Tutorials and Learning Games Using Flash and Toolbook

Dan Lim, Ph.D.
Director, Instructional Technology Center
University of Minnesota, Crookston

Visualization and interactivity are two of the most widely used buzz words in multimedia and online learning. They are also the two important learning concepts in the latter two components of the widely used Chinese proverb: "What I hear, I forget; what I see, I remember; what I do, I know". In the paperless web-based courses the author has taught during the past few years, visualization and interactivity presented the biggest challenge as well as promise. Both Flash and Toolbook have met the challenge and promise extremely well in creating visualization and highly interactive learning objects. The author went through a set of problem/need selection criteria and identified several areas that would be most helpful to students for development.

Rationale

Online animated tutorials were designed in Flash for a paperless course, Graphics Interface Design, taught in Fall and Spring semesters 2000-2001 at the University of Minnesota, Crookston. Flash was chosen for its powerful vector animation, flexibility through scripting, and ubiquitous online deployment. Interactive (web-based) learning games were designed in Toolbook Instructor, a high-end full-scripting interactive authoring software. Toolbook was chosen for its rapid development learning objects and very powerful and flexible scripting engine. Toolbook's seamless web deployment option (native & dhtml) was another reason for selecting it for developing online learning games. The following list of principles of interactivity design was used for both Flash and Toolbook development (more for Toolbook):

Principles of Interactivity Design:

- Engage learners
- Increase learner control
- Provide meaningful feedback
- Promote self-learning
- Incorporate practice
- Maintain the right level of difficulty
- Keep learners coming back
- Apply randomization wherever possible
- Allow customization of content & media
- Keep interface intuitive

Flash Tutorials (FLASH 5)

Flash Tutorial 1: PhotoShop Collage

Flash helps students visualize the most critical step in the collage graphic task. Students in the Graphics and Interface class generally have trouble with where and how to draw the gradient line. The highlight of this animated tutorial is showing students the effect of the gradient line in blending two or more pictures seamlessly into a new artistic collage picture. Student can click the button to repeat this critical step as many times as desire.

Flash Tutorial 2: PhotoShop 2-Layer Blending

Flash helps students visualize several critical steps in the process of creating a 2-layer blended picture. Students generally have trouble applying the layer mask to hide the top layers, airbrushing the hidden layer to the foreground, and adjusting the opacity to achieve the best texture mixing results. The above three critical steps are animated in this Flash tutorial to help them identify where their mistakes lie.

Flash Tutorial 3: Using PhotoShop 3-D Transform – Cylinder Tool

In this Flash tutorial, the critical steps of planting an additional anchor point, dragging it to create the desirable shape, and removing the background are animated for students to visualize this intricate graphic task. It is quite difficult to describe verbally how the above steps are done. But a combination of simple instructions and visualizations through Flash helps student enjoy using the tutorial to complete this graphic assignment.

Flash Tutorial 4: Using PhotoShop 3-D Transform – Cube Tool

There are many critical steps in this complex graphic task. Helping students visualize those critical steps interactively is essential to achieving comprehension and execution of drawing the 3-D "Cereal Box." Merely reading instructions and viewing screen shots are generally not sufficient for novice users of PhotoShop. Several critical steps in this graphic task don't quite make sense if Flash is not used to help students visualize what they are asked to do. Complex graphics can become simple to grasp if interactive Flash animation is utilized. This particular Flash tutorial has been designed to help simplify some very complex instructions.

Flash Tutorial 5: Creating a Flash Intro

Finally, what better way to illustrate the power of Flash animation than to use Flash to turn the complexity of Flash concepts and interface into something easier to grasp for novice users. This particular Flash tutorial animates the steps of creating an elaborate Flash intro for a course website. Again, the most critical steps are the most beneficial to animate in Flash. Motion tweening, shape tweening, alpha fading, and the fundamental concepts of symbols, frames, and instances are effectively illustrated through interactive Flash components.

Flash Learning Game: Millionaire Game Learning Object (Customizable)

The Millionaire Game learning object was created to allow novice Flash users to enter new questions into the game without learning anything new in Flash. The questions are entered into a question movie within the game. Questions are randomized. The options are also randomized. Each of the three clues (lifelines) provided is to help users to get out of a difficult question. If the user fails to give the correct answer, the correct answer is given and the game comes to an end. The user can restart or quit the game altogether. The purpose of this learning object is to help learners learn some difficult content through responding to new and repeated questions. New questions serve to challenge them while repeated questions help reinforce their previous learning.

Toolbook Iinstructor (V 7.1)

Toolbook Learning Game: Millionaire Game Learning Object (Adaptive)

This Toolbook Millionaire Game is very similar to the one developed in Flash. The only difference is instructors do not need to have or learn the software. In fact, instructors need not know what the software is! The only thing they need to do is to develop the content and enter the questions into the learning object. But they do need to open the application through a plug-in and enter questions through a browser. An internal proprietary script is used to create options where users can save the application and re-deploy it on the web. The highlight of this learning object is its high-end adaptive interactivity allowing instructors to enter new questions to create a new game for themselves.

Toolbook Learning Game: What's the QuestionJeopardy-Like Game (Adaptive)

This game is similar to the Toolbook Millionaire Game learning object that it allows instructors to determine categories and enter new questions without having or learning any software. When instructors are done with preparing the game, learners access the game through a browser and a plug-in. This game allows learners to randomly select questions of a particular level of difficulty. This gives users more learner control. Questions are randomized at each level. So, users can play repeated games with new and repeated questions.

Biographical Sketch

Dr. Dan Lim has been the Director of Instructional Technology Center at the University of Minnesota, Crookston (UMC), since 1997. He also teaches computer courses for the Information Technology Management program each semester at UMC. Dr. Lim is a frequent presenter at national and international technology conferences. His research specialties are in paperless learning, adaptive learning objects, interactive Flash development, and technology cultural change.

Address: University of Minnesota, Crookston
2900 University Ave
Crookston, MN 56716
E-mail: dlim@mail.crk.umn.edu
URL: http://webhome.crk.umn.edu/~dlim/
Phone: (218) 281-8381

Virtual Universities Need Real Guidance Counsellors

Andrew Linder, Ph.D.
Professor
DeVry Institute of Technology

In the more delirious versions of the vision, "online," "virtual" or 'open" universities dissolve completely the campus on the ground as students take like ducks to water to learning platforms of information systems and media technologies. Such imagined communities are tested when real students step through the portals and find out for themselves if traditional brick- and- mortar colleges are indeed merely plumbing and sentiment. They come, like all students, with very different hopes and goals, ways of orienting and motivating themselves, distinctive learning styles and special needs. Traditional campuses await the cohorts with student service, guidance support and a managed transitional year. By contrast, on virtual university sites, comprehensive support on a personal level is notable mainly for its absence.

On-line bulletin boards, common work areas, embedded help systems and cyber cafes aside, the first year experience for virtual university students who "solo" entire online programs frequently becomes a sad and frustrating experience. Learners, adult or not, look around the cyber-campus for help. It is very often the instructor who is called upon to assume responsibility for counselling needs that arise routinely in online learning. In this way, educators without professional counselling skills, especially in online transactions, may venture into uncharted areas of institutional and personal responsibility and bring unprecedented danger upon all players, the educators, the students and the institutions that employ them.

True, there is no lack of technical and administrative support on cyber-campus of the e-commerce, account management variety. In an era of outsourcing, mergers and provider concentration, contractors and brokers of distance education help students to choose courses, register in programs, arrange their transfer credits and tuition-payment and then shepherd them to the site of self-directed learning. Quality distance education programs warn applicants that they will be on their own a lot after that, and need to enter thoughtfully programs that demand task-persistence, technical skills and aptitude for online study. A profile is drawn up of the ideal student for this type of venture—motivated, adult, inner-directed. Few virtual universities fail to post warnings of the challenges of virtual university education in their online boutique windows: "Is Virtual Education Right for You."

It is not certain that the registered students heed the warning. There are learners, perhaps a great number, who do not transfer responsibility from cohort-managed to the individual sphere readily. Sometimes they just walk past warning signs in their need for transfer or bridging credits, or a certificate added to their personnel files showing their commitment to the principles of life-long learning. At issue now is student satisfaction, not learning outcomes. Assessment of distance education students has begun to show evidence of deep dissatisfaction with rigid, inflexible and unresponsive e-education programs, especially in the absence on learning platforms of professional guidance, counselling and student advocacy. An absence of campus support at the personal level has an impact on program completion, student satisfaction, learning outcomes and still other variables by which quality distance education universities seek to be recognised, not least of all by accreditation authorities (Biner& Dean, 1995; Davison, 1996; Hara&Kling, 2001).

A virtual university is an expensive proposition indeed. A well-known example of the challenges to come is the failure of Western Governors University, the dream of 19 governors, legislatures and state educational authorities, one of the most heavily promoted ventures ever in the bringing about of a university on the basis of the new information and media technologies, from Internet to satellite. The publicly funded mega-project was stacked with everything $ 9 million could buy including a library of 60 full text databases to rival the Vatican's. Under the latest constructivist dispensation, a wide array of courses was offered with competency based online testing for those who would carve individual learning paths. For counselling and support, WGU brought to market the pride and joy of the content folks, the **SmartCatalog,** a "killer app", the outsourced or "bundled" delivery of online counselling services on an immense technical scale. (Aoki &Pogroszevski, p. 11) The portals opened and the greatest enrolment surge since the G.I. bill awaited. To the delight of enemies of distance education everywhere, virtually no one came through, and the institution failed (Cervini, 2001).

Even from the very practical point of view of institution's profitability and liability, not to speak of its social and ethical responsibilities, it is unwise to drop students in their distributed masses on cyber-campuses without professional one-on-one guidance and orientation. On-line educators and virtual universities need to become more reflective practitioners of their art and respond to two pressing issues: (1) the learners' need for a more personal attention and counselling on virtual campuses and (2) an institutional need to define the legal, ethical and professional parameters of online teaching, call in the cybercounsellors.

The Cybercounsellor Is on the Job

Marc Verhoeve invented "cybercounsellor" in a column hosted on the website of the Ontario School Counsellors Association as a designation for online practitioners of he educational counselling (Verhoeve, 1999, p. 2). The American Counsellors Association adapted the term, launched its own site called "cybercounseling" and attempted to define the parameters of licensed practitioners by issuing "Ethical Standards for Internet On-Line Counseling" (ACA, 1999) Today, Student Services on most campuses is wired. Professional counsellors are developing impressive skills working with distance education tools. Their skills are urgently needed in distance education university programs to orient and give orientation and day-to -day counselling, foster autonomous study practices, build student advocacy and orientation into learning programs, advise on career, study skills and life problems and deal with the many interpersonal issues of online educational relationships.

In general, student support programs are modular in nature, fitting into the curriculum in temporal stages of the programs: the transition, the continuation and completion. Each stage requires a different form of intervention, from initial screening and orientation of incoming students, to counselling on life and learning issues, concluding in career placement assistance.

Online Student Orientation

Students registering for online programs should be assessed to identify each student's learning style, technical skills, preparedness for independent learning and ownership of necessary distance education tools. No student should enter a course of studies without the usual campus orientation including a guided tour of the library and training in its usage, research and essay writing clinics, and still other introductory programs of the first year student experience. Tutorials on mathematics and writing, practical skills like web research and time management, counselling on psychological issues could be as readily delivered online as any other course. However, something more than embedded interactive help features are needed to work with students in severe need of remediation in areas of verbal or mathematical literacy. Assessment is most effective when it reflects an understanding of online learning as integrated with a program, ongoing, and not episodic. The "personal" attention of a counselling practitioner is needed throughout the course of instruction for students at risk of attrition. Students need to know that a human being is reviewing and commenting on their efforts at the earliest stages of their involvement with online learning. For students "at risk", intervention can take place in many forms including online motivation and personal counselling seminars, a closer online supervision of coursework by a tutors, and online interviews with the students followed by online consultation among course instructors. Needless to say, retention measures impact on completion rates, and serve as one of the measures by which accreditation authorities evaluate colleges and universities.

Counselling on Life and Learning Issues

The students of virtual universities are often so distributed and diverse that it is difficult to build interpersonal processes and procedures even into courses that need group work. Anywhere, anytime education means just that. Students can walk in and out of the portals at any time within the framework of their "give your password and account number" relationship with the institution. If they find the environment uncongenial, inhuman and unsuited to their learning styles, they walk away. There should be personal and professional attention on campus by means of e-mail and helplines for telementoring, or group sessions can be held by means of synchronous communication features of learning platforms.

The cyberscounsellor builds into the program a personal, human interface and finds ways for learners both to create assessment experiences and to use them to develop responsibility for their own learning processes and outcomes. A close monitoring and observation of students who complain of lack of motivation or inability to work within the program structures, furthermore, yield valuable information to tell us how students learn online at the program level. Each educational tool has its own pedagogy just as each media has its unique function and characteristic. The acquired information is a necessary as a feedback mechanism to meet learner needs and add to the institutions' own knowledge base.

Career Counselling

If in any way the online delivery of learning has an advantage, it is in its study-to-work applications. Students attend online universities for practical reasons usually involving career advancement. Career development is as well suited to online than to face-to-face communication. As in other areas of counselling, strict rules and regulations of professional associations guide online transactions. (NCDA, 1997) In an era when resumes are routinely put on personal websites and job searchers employ the Internet as a principle resource for research and application, distance delivery of career counselling is practised on a large scale by campus career services. Transferred to the cybercampus, the existing programs could be augmented with counsellors working one-on-one on resumes and skills assessment. If this area of the university's services yields a career and a prosperous life for graduates, the pains of online learning are forgotten, and the association with the institution warm. Only this way will distance education universities develop affiliations and affections that physical campuses evoke in their alumni.

The Obligations of Distance Educators and Virtual University Institutions

Cybercounsellors need to counsel the teachers and the institutions that employ them of their social, legal and ethical responsibilities in this unprecedented learning environment created by new technology. It is only prudent to identify dangers along with opportunities early in virtual university building. A relative lack of coordination among the course instructors, designers, technicians and learning officers is inevitable in distributed organizations. However, virtual universities by their constitution as electronic learning platforms can easily fall prey to a lack of congruence between structure and activity, an absence of linkage between what the program is designed to deliver and the real-life transactions that take place. There are grave dangers. Online practitioners of counselling are needed to:

- establish adaptive services for students with disabilities and special needs
- create conditions for the privacy and confidentiality of the transactions and the records kept of them,
- counsel administration on accessibility and the social, ethical and legal implications of admission and evaluation practices,
- investigate and make recommendations for complaints against professors ranging from overly long assignment turnaround times, difficulty in contacting instructors, unfair workload, to abuse of power,
- set up fair, honest and lawful means for dealing with complaints against students on issues ranging from plagiarism to disruption and interference in network activities such as the propagation of computer viruses or worms,
- intervene to prevent abuses of any kind whether motivated by prejudice concerning gender, race, ethnic origins, sexual preference, religious belief or any similar factors,
- prevent "flaming ,the sending of threatening, obscene or harassing online messages,
- ensure that obligations and commitments made to internal and external constituencies are met.

Every one of the above "human relations" responsibilities could keep awake campus administrators of established colleges and universities. The responsibility does not become less for chief learning officers of online institutions that can only hope to meet rigorous accreditation requirements by advancing behind a student support and guidance program to which course and program objectives are aligned with clear policy formation and means of implementation.

Conclusion

When the services of professional guidance counsellors is embedded effectively in institutional systems, expectations are made explicit and public and student complaints are seen as an opportunity to focus collective institutional attention on areas that need improvement to meet with integrity institutional responsibilities to the students and the public. To prove their worth and take their place among established and respected institutions as an equal, virtual universities need to put in place real institutional structures, online or not, to ensure that the support students receive on physical campus is transposed, even augmented, in degree-oriented programs delivered by distance and alternative means. The new killer-app of virtual universities may be the Guidance Counsellor, a real one.

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Biographical Sketch

Andrew Linder studied pre-postmodernist critical theory with Marshall McLuhan at the University of Toronto He never exchanged a word on technology with the media guru, but learned the great deal from him on the human interface in mediated communication. He has been at work on the theme in teaching and writing all his life.

Address: DeVry Institute of Technology (Toronto)
206 St George st. Penthouse A
Toronto, Ontario
M5R 2N6
E-mail: alinder @ tor.devry.ca

Meeting the Challenges of Service Technical Training Through Interactive Satellite Delivery

Mary McClain
IDL Training Development Manager
Raytheon Professional Services

JoAnn E. Wallace
Performance Consultant
Raytheon Professional Services

In early 1999, General Motors (GM) embarked on a bold initiative to restructure its training program for which the goal was to standardize the management of all GM training and, in large part, the training itself. Guided by the leadership of this GM Common Training program, Raytheon Professional Services (RPS) facilitated the restructuring of training for GM dealership service technicians. The product of this partnership is the General Motors Service Technical College (GM STC), which provides training to nearly 100,000 automotive dealership technicians at approximately 7600 dealerships across the country, including Alaska, Hawaii, and Puerto Rico.

What did this mean for GM dealerships? It meant a paradigm shift from predominantly instructor-led knowledge-based training (IBT) to a comprehensive, flexible delivery system that emphasizes performance-based outcomes. It meant the implementation of a robust curriculum, which includes an integrated media mix of video, satellite delivered interactive distance learning (IDL), computer/web-based training (CBT/WBT), and facilitated hands-on performance (in training centers). The reduction in days needed for off-site training due to the availability of IDL and CBT/WBT right in the dealerships made utilization of the training more cost effective and convenient. It also meant an Individual Training Plan (ITP) for each technician enrolled in the program, which potentially leads to master certification in one of twelve certification areas and/or fulfillment of dealer service training standards.

Just-in-Time Training

One of the first challenges posed to RPS was to close 29 training centers where IBT had previously been delivered while minimizing the time during which no training would be available. The solution: IDL.

While our hands-on (IBT) folks were reconfiguring training centers and developing performance-based assessment activities, and the CBT unit was working out the details for providing training that could be accommodated by a myriad of dealership infrastructures, designers and developers began migrating courseware from the "old" program to IDL instruction. From July to December of 1999, RPS designed, developed, and implemented 31 IDL courses using GM's satellite delivery network. Because of its early delivery and accessibility, IDL became the flagship of the STC media mix. It allows us to provide timely training that incorporates the latest in product and service information.

For example, 23 of the original 31 IDL courses were specifically designed as "interim" courses that would be phased out of the program as comparable CBT and WBT were developed and phased in. Course content included foundational information such as component theory and operation as well as instruction on how to diagnose vehicle concerns.

In contrast, our long-term "core" IDL provide only diagnostic strategies that can be applied to any number of vehicle concerns. These courses have prerequisite CBT course components, which train in component theory and operation, and are followed by facilitated hands-on classes in which students demonstrate performance.

Keeping a technical curriculum up to date as service information, technologies, and/or products change can be a costly proposition and a versioning nightmare. Our GM Service Know How program offers several types of seminars through the IDL network that allow us to keep step with the volatile nature of product and service information. Although each session features a call-in session and panel discussion with engineering and service experts, they do not include training activities or in-depth coverage of theory and diagnostics. They are short, informational broadcasts that bridge the gap between the time new information becomes available and the time new courses are developed or existing courses are updated.

The New Model Features seminars are broadcast one or two months before the release of new products, and the Technology Close-Up seminars air at the end of each month then repeat several times throughout the following 30 days. These seminars familiarize technicians with various aspects of new products, including key service-related tips, so they have some awareness of the product before its release. Emerging Issues seminars are broadcast in a newsmagazine format on a monthly basis. Their main purpose is to keep service technicians current on existing vehicles and technologies by highlighting current service bulletins and warranty issues.

Utilizing a variety of IDL formats allows RPS to provide just-in-time training that incorporates the latest in service information and technology.

GM STC training is also very accessible to participants in the GM Common Training Program. Each dealership enrolled in the Common Training Program is equipped with IDL capability on premises. Technicians must no longer leave the dealership for days at a time in order to receive training at an off-site facility. They simply walk to the "training room," turn on the television, and log into the broadcast.

GM STC offers sixty or more IDL hours per week of technical training, which accommodate all time zones and service schedules. Classes are offered at least three times per month—at least once in the morning, once at mid-day, and once in the afternoon. Seasonal demands and new product information are also taken into consideration. For example, more air conditioning courses are required as the weather becomes warmer in various regions. When a new diesel engine was released last year, as with most new products, thousands of technicians rushed to take the related training. During periods of high demand such as these, we saturate the broadcast schedule to accommodate special needs accordingly.

Dealerships receive a monthly program guide that includes IDL broadcast schedules and other Common Training offered during that month. Technicians can also access schedules and enroll in courses electronically through the Training Management System (TMS), either through a web URL or the GM intranet.

The Paradigm Shift

How do we facilitate the paradigm shift for learners from hands-on, experiential learning to this somewhat "two dimensional" learning environment? This is perhaps the greatest challenge in terms of meeting the needs of our audience within this media. In essence, the learners must allow the instructor to be their eyes and hands. Conversely, instructors must teach almost from a stream of consciousness, vocalizing their thought processes as they see, feel, hear, and smell for the technicians. We do this utilizing a variety of visual stimuli, a variety of technologies, and a high level of interactivity via the ONE TOUCH® Knowledge Systems (ONE TOUCH®) communication system.

As with any IDL program, incorporating frequent visual changes is imperative in order to avoid "talking head" syndrome. Likewise, a variety of visual formats is necessary, not only to keep pace with frequent changes, but also to keep learners alert and interested. RPS utilizes a number of technologies in its design and delivery of IDL to provide these frequent and diverse screen changes.

Although the instructor is usually seated behind a desk so that he or she has ready access to the script and production controls, he or she is able to move freely about the studio. We also have the ability to bring vehicles, engines and other components into GM's studios. These capabilities allow us to project the instructor from a number of vantage points. For example, he or she may demonstrate a diagnostic test or service procedure on an actual vehicle. He or she might walk over to an electronics board in order to explain the intricacies of an electrical schematic. In fact, we might even view the instructor from the monitor of a vehicle's entertainment system!

Second only to the instructor, Microsoft PowerPoint® is probably the most commonly used visual element in IDL. It can be used to project topics and major points, other text-based graphics, line art, digital photos, schematics, diagrams, and any other compatible images.

To avoid potential technical hangups when demonstrating complicated or lengthy procedures, video is used. This is also useful when the broadcast studio cannot accommodate more sophisticated procedures or specialized equipment such as the generalized water test in the Waterleak and Windnoise Repair course. Animation is also used to enhance instruction when video and live action are not viable options.

Instructors can access the internet and other special programs, such as GM's electronic service information software, by interfacing personal computers with the studio equipment. This allows for more effective and complete instruction than attempting to elaborate on simple screen captures.

Using the overhead camera brings life and energy to the broadcast. It is a reminder that there is a live instructor with whom learners can interact, and it accommodates spur-of-the-moment activities that aren't necessarily scripted into the broadcast. Instructors can zoom in and out as need dictates while showing actual parts, components, or diagnostic charts. They can also write lists, fill in forms, and complete similar activities as students provide feedback via keypads.

Various other cameras are available for use in special situations such as the "lipstick" camera, which can reach into small, enclosed spaces and hand-held cameras that can be carried to virtually any location in the studio. More often, an additional camera is focused on a workbench or specific portion of a vehicle, which facilitates easy physical transitions for the instructor and producer.

A visual smorgasbord is only one element in an interesting and captivating broadcast. Equally important to any audience, but especially experiential learners, is a high level of interactivity. Like the courseware visuals, interactivity must be frequent and varied.

RPS designs every course to include several types of questions: multiple choice, open-ended and call-in. Responses from the audience for all of these methods can be used as springboards for open discussions between technicians and instructors. However, there is a caveat to open discussions. Since each IDL broadcast is scheduled for a specific duration, interaction must be controlled so as to fit within the confines of required content and scheduled broadcast time.

Participants are often asked to complete activities similar to those provided in traditional IBT training. Exercises such as fill-in-the-blanks, matching, and pre-reading are provided in participant guides. These workbooks are provided prior to broadcasts to technicians who enroll by a given deadline. Participants are asked to complete exercises during the broadcast then share responses via the ONE TOUCH® system.

Perhaps our most effective strategy for facilitating the paradigm shift from IBT to the IDL environment is the use of diagnostic scenarios. These exercises are valuable for several reasons: they provide opportunities for high levels of interactivity, they add relevancy to the course content; and they bring technicians as close to application and performance as possible.

Within a diagnostic exercise, a real-world customer vehicle concern is presented. Participants use service information and other data provided by the instructor to work through the proper diagnostic processes in order to uncover the root cause and appropriate repair for the concern. Parts of this exercise involve using diagnostic tables, charts, and other service information. It usually requires learners to view video or photos of tests, checks, and procedures then analyze the results. They are often asked to select the correct multiple choice responses based on various aspects of the activity. Participants are usually expected to call in and describe, explain, or rationalize various diagnostic paths.

While diagnostic exercises and other IDL activities are not perfect substitutes for experiential learning, they are great substitutes for the lecture-based portions of traditional IBT instruction. They are valuable strategies for enabling technicians to demonstrate their knowledge and skills when they experience the hands-on course components in their training plans. Perhaps the greatest advantage of IDL to technicians is that they receive training designed to increases job performance while never leaving the dealership. This means minimal time away from the service bay and more money in their pockets.

Evaluation

Evaluation is a part of the systems engineering process used on the GM STC program known as the Product Development Process. Integrated Product Teams (IPTs) representing all technical and support functions and organizations critical to developing and delivering a given product carry out this process. All functions are cognizant of design concepts, development and delivery requirements, and project status. These empowered cross-functional teams are integrated so as to optimize the end product, rather than the function for which they are primarily responsible. The Product Development Process includes front-end courseware analysis, design, development, and continuous evaluation. The integrated Product Development Plan relates requirements, planning, resource allocation, execution and program tracking over the lifecycle of the product. Utilizing a multi-disciplined approach to planning ensures that teams at all levels have all available information with which to enhance their decision-making.

Several pieces of crucial information are derived from evaluation data. The GM STC program is currently measured through Customer Satisfaction and Post-Test Analysis evaluation data. Processes for Behavior and Business Impact, along with Return on Investment, are in development.

Customer Satisfaction is measured using a combination of survey data captured through Likert scales and verbatim comments. One of our evaluation goals is to obtain response from 100% of the student population. We are currently achieving 80% of that target across all media types (video, CBT, IDL, hands-on).

The survey is organized into meaningful categories, such as Course Relevance/Value, Course Design, Course Delivery, and Instructor. A common set of survey questions is utilized across all media types. Over time, the resulting data indicates those courses with potential problems. Media-specific questions are also included in the surveys which allow us to pinpoint specific issues for analysis, then we use the data to continually improve the quality of our products and delivery methods.

Post-Test Analysis is measured using pass rates, score ranges, and test item analysis. Pass rates and score ranges which fall outside program criteria are identified and investigated to ensure that test items are valid and are correlated to course content. Test-item analysis is conducted on a routine basis to ensure test-item validity. These metrics are reported to the curriculum owners as well as the customer. They are used to enhance the quality of the courses and the course post-tests.

The greatest challenge in evaluating the GM STC program is managing a multitude of evaluation items from a variety of distant sources and a varied media mix. Data is collected from internet-based training management and issues tracking systems, electronic satellite broadcast data, paper surveys and faxed-in comments. Our training management system provides us with summary reports; however, a data warehouse was created which allows us to view data previously inaccessible, respond to customer inquiries more rapidly, and to predict trends and future training demand.

The evaluation results, as well as feedback from quarterly customer meetings, are distributed to the IPTs. A top-level analysis is provided on a monthly cycle, and a finer level of analysis is provided quarterly. This information is distributed electronically, placed on the program intranet, provided at team meetings, and a hardcopy is placed in our visual office environment.

Opportunities for improvement are highlighted and recommendations for improvement are provided. The IPTs review this data, and critical issues are rectified immediately. Less critical opportunities for improvement are examined and incorporated at course refresh. At the course refresh phase, evaluation data, customer input, product information, subject matter expert and management input are gathered. This data is reviewed and incorporated into the next-generation courseware. In total, this process enables Raytheon Professional Services to provide optimized courseware to our training customers.

Biographical Sketches

Mary McClain is the IDL Training Development Manager for General Motors Service Technical College (GM STC). She holds a M.Ed. in Instructional Technology from Wayne State University.
Mary oversees all aspects of IDL course development for the GM STC program, and is a member of the GM STC Curriculum team. She is also responsible for analyzing and responding to customer feedback regarding the program, and she spearheads the IDL continuous improvement initiative.

Address: Raytheon Professional Services
1650 Research Dr.
Troy, MI 48083
E-mail: mmcclain@rps.com
URL: www.gmstc.com
Phone: (248) 619-8409
Fax: (248) 619-8680

JoAnn E. Wallace is a Performance Consultant at Raytheon Professional Services (RPS). She holds an MA in Applied Experimental Psychology/Human Factors. JoAnn has conducted a multitude of research projects and created a session for Raytheon Consulting Group's System Engineering Workshop. She represented General Motors at the Global Human Factors Conference and has represented Hughes Aircraft

Co. at multiple GM Design Reviews. As a member of the GM STC Performance Assessment team, JoAnn is responsible for presenting evaluation results to GM and RPS management. She is also the lead for research and key business process documentation.

Address: Raytheon Professional Services
1650 Research Dr.
Troy, MI 48083
E-mail: jwallace@rps.com
URL: www.gmstc.com
Phone: (248) 619-8729
Fax: (248) 619-8680

Using the Web to Provide Learning Context: The Challenges

Dr. Jill Mordaunt, Lecturer in Social Enterprise
Chair of Public and Non-profit Certificate in Management
Open University Business School

This session, aimed at more experienced distance educators, describes and discusses the learning gained in the process of creating a common curriculum in management education which at the same time seeks to meet the needs of niche markets. It explains the key role envisaged for web technology in this process and identifies some of the problems encountered in doing this.

Background and Context

The Open University (OU) was established in 1969 as a national university based exclusively on distance education, or 'supported open learning', to use the term the OU considers more accurately descriptive. It has 13 regional offices covering the UK, Ireland and Continental Western Europe. Increasingly it is operating internationally and the model has been emulated in a number of places, including India, Hong Kong and Zimbabwe.

In the 1990s the Open University Business School (OUBS), which is one of 13 faculties and academic units in the university, offered discrete contextualised Management Certificate courses for students from two sectors: the voluntary and nonprofit sector and the health and social care sector. (For a detailed description of the voluntary sector management programme see Cornforth et al (1998)). These have attracted a steady but relatively small number of students: over 1,000 registrations a year, approximately 15% of OUBS' registrations on Management Certificate courses. Although the courses were well received and achieved consistent high evaluation ratings from students, over the years a number of problems and constraints to cost and time effectiveness became apparent. As OUBS planned its revamping and updating of the Management Certificate programme, to start presenting in the year 2000, matured, these separate posed various problems.

First, the OU, as a mass provider of supported open learning incurs substantial fixed costs for each separate courses it develops and presents. These costs are principally those of:

- Producing, quality assuring and maintaining its corpus of specially designed learning resources in a mix of media: course texts, readers, set books, video, audio, CD-Roms and online elements;
- Recruiting, developing and supporting the specific cohort of local tutors who provide personal learner support, through a combinations of face-to-face and online tuition and assignment feedback
- Establishing the professional logistics required for each courses: from its materials mailing arrangements to its examination setting and award processes.

These mean that a course is complex and costly to produce. Crucially however, this model is scalable—the University has some 200,000 people studying with it in any one year—high investment costs require large numbers over the lifetime of a course. This poses problems for small courses, such as those mentioned above, as they have similar fixed costs to the larger generic programmes in management. Each course has its own course team of academics and administrators constraining the resources of the Open University Business School (OUBS) in offering new and more diverse qualifications, for example a Certificate in Accounting and specialist Masters Programmes.

Secondly, the autonomy associated with separate course teams carries the risk of divergence in curriculum and assessment in order to achieve the same qualification. For example, the voluntary sector management course was written as a one-off prior to the school offering a certificate in management and it contained elements that would now be classed as Diploma and MBA material. The health services management certificate was developed in conjunction with MESOL (Management Education by Supported Open Learning) and funded by the UK Department of Health to meet the training and development needs of (mainly) nurses in the National Health Service. Consequently much of its form, content and assessment was externally driven. The particular approach the OU had taken to contextualise learning may have met the needs of managers in specific sectors, but at the price of inconsistency in the learning objectives and standards within what was, to the external world, the same qualification. In an era of rigorous external audit and inspections, such inconsistency needed to be addressed.

Thirdly, there was evidence of increasing convergence in the requirements of managers across different sectors. When the separate sector courses were developed in the late 1980s and early 1990s, the management education curriculum was effectively a business oriented one and the very concept of 'management' was contested in some quarters of the voluntary and public sectors. The need for differentiation and sectoral sensitivity was paramount. Service delivery patterns and managerial careers in the public and non-profit sector now involve more cross- sector working and trajectories. Increasing numbers of public and non-profit sector managers were choosing the School's generic courses rather than the sector specific courses because they wanted to be exposed to the experience and staff of other sectors in their learning, although not necessarily at the expense of any customisation. OUBS needed a new model that replaced the 'apartheid' of separating public, non-profit and private sector managers with an approach that simultaneously offered integration and customisation.

Fourthly, there were demands from our market for greater flexibility in our product. Corporate sponsors in particular wanted either their own versions (British Aerospace, Police and Prison Services for example) or smaller short courses for their staff. OUBS needed a model whereby its Certificate teaching material existed not only within the confines of one specific course registration; resources needed to be capable of being unbundled or presented in different ways to meet different needs speedily and cost-effectively. If accreditation was required, there would be a clear curricular and assessment framework, within which different ways of studying and customising could be delivered according to need and budget.

In redeveloping its Certificate programme, the School therefore sought to retain and enhance its offerings to it specialist voluntary and heath and social care markets, but within a coherent curricular and assessment framework and in ways that would help the school meet other sector or corporate needs in the future. (Batsleer 1998) However this redevelopment needed to incorporate the OU's experience of what worked in management development through supported open learning.

The presentation will describe the solutions we devised to address these challenges and draw out some of our learning about what is successful.

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Biographical Sketch

Dr. Jill Mordaunt is both an experienced educator and a practitioner in nonprofit management. She has worked for the Open University in various capacities since 1986. She is now chair of the Public and Nonprofit Certificate in Management (the entry level for the MBA) and a lecturer in Social Enterprise at the Open University Business School.

Address: Open University Business School
Walton Hall
MILTON KEYNES
MK7 6AA UK
E-mail: J.Mordaunt@open.ac.uk
Phone: ++44 1908 659289
Fax: ++44 1908 655898

Collaborative Filtering Applications in Distance Education

Jo Ann Oravec, Ph.D., Associate Professor
University of Wisconsin-Whitewater
College of Business and Economics

This presentation analyzes several modes through which individuals can construct a personal identity, establish voice, and develop critical thinking skills in distance education settings. Collaborative filtering and recommender systems are being used within organizations and in public contexts for knowledge rating as well as the facilitation of interactions among individuals. With many of these systems, individuals can establish and maintain a "reputation" based on the quality of their participation. Weblogs (in which individuals critique various web materials in a "journal" format) provide yet another means through which individuals can establish a distinct perspective while exchanging critical insights with others.

Collaborative filtering and recommender systems as well as weblogs have all been utilized in community and business contexts for various purposes. The presentation addresses how these and related systems can be adapted for distance teaching and learning contexts to provide new forms of interaction and to extend participants' capabilities for writing and discussion. There are many Internet-based applications of these systems that are not supported by universities but are available for anyone to utilize—thus giving individuals the opportunity to continue their educations indefinitely in "collabversity" settings. According to Figallo and Rhine (2000), the incentives for participation in such systems include public recognition, visibility and the "community-exchange" factor: "if a user posts information of value to his or her fellow users, it's more likely that some of them will post information of value to him or her" (page 39). Collabversities such as Slashdot.com and Plastic.com (described below) are thus extending the channels through which individuals can obtain intellectual and social interaction in a topic-focused, moderated setting outside the boundaries of the university.

Collaborative Filtering and Collabversities

Collaborative filtering and recommender systems apply many of the strategies of expert matchmakers in matching willing participants and in providing individuals with links to Internet materials that best serve their needs and interests. Many of these systems also allow individuals to create and maintain reputations based on how their contributions are evaluated either by fellow participants or by editors, thus constructing "virtual individuals" that reflect the levels and quality of their participation (Oravec, 1996). In my presentation, I will describe a number of these systems and compare their features, relating the systems to distance education contexts.

Various collaborative filtering and recommender systems differ in their basic structures, but have some common threads: through the collection and analysis of information about individuals and their preferences, sets of individuals with comparable or compatible characteristics are matched (if only in their virtual forms) and recommendations or opinions are shared. For example, in one variety of collaborative filtering (the kind used in MovieLens, described in Carlson, 2000), individuals are given recommendations based on the opinions or other expressions of the group members to which their profiles are the closest match. The assumption of this system is that individuals would probably like the movies, books, ideas, or other items that their virtual cohorts would like. Demonstrations of MovieLens and an assortment of other systems are available on-line for free for students and educators to explore and discuss. Also available on-line are a number of collabversity forums that incorporate some collaborative filtering strategies, such as Slashdot.com and Plastic.com. At the University of Wisconsin at Whitewater, students utilized Plastic.com as an introduction to Internet design issues as well as a vehicle for on-line community participation. Plastic.com has a mechanism that incorporates "reputation" establishment and maintenance: moderators rate the contributions of participants, and participants with high ratings can become moderators. Readers can filter out contributions by individuals with ratings below a certain threshold (of their choice). In other reputation establishment schemes, reputations are set through popularity rankings (how many people access one's contributions) or other compiled evaluations.

These systems can have a variety of uses in distance education contexts. In society at large, reputation establishment and maintenance play large roles in professional realms (Whitmeyer, 2000), so these systems can provide salient lessons to participants. These systems can serve as forms of academic evaluation (although this can be problematic, as discussed in a future section). In large classroom settings, collaborative filtering and recommender systems can help to match students with compatible perspectives; a system is already in experimental development that matches educators with other educators worldwide who have similar research interests. Here is a description of WebCenter: "All actions on entities performed by users of the WebCenter are recorded in a database. This data is used by a collaborative filtering system in the Recommendation Center to recommend entities of possible interest. The system calculates its recommendations by comparing the user's history of use of the WebCenter with the histories of all other users. The system selects a group of other users who have a similar history of use. They have read and ranked highly many of the same publications, searched for resources in the same categories or using the same set of search arguments, read some of the same messages, etc. This list of people is returned to the user as people with whom they may want to begin conversations to discover productive shared interests" (Cambridge, 1999). Ideally, individuals will be able to use WebCenter to connect with others—and perhaps discover more about themselves and their own interests in the process. These systems can be integrated into various discussion forums, providing means through which students can connect with each other and obtain Internet materials of high quality with minimal assistance by instructors. Becoming acquainted with collaborative filtering and collabversities can thus aid students in becoming independent, lifelong learners.

Weblogs in Critical Thinking Approaches

Since its emergence as a popular form of exposition in the late 1990s, the weblog has become an increasingly recognized genre on the Internet. Although some are composed by teams or are institutionally sponsored, weblogs have primarily served as modes of personal expression, providing a vehicle for individuals to contribute commentary on Internet material, react to current events, or provide personal reflections (Oravec, forthcoming). Weblogs are intrinsically time-bound, following the diary or journal format that is familiar in many writing instruction contexts. Some weblogs specialize in certain topics, such as distance education (Online, 2001), though others discuss and critique vast ranges of Internet resources. Online diaries (web-based streams of personal reflections) have emerged as a similar genre, one less closely tied to the critique of Internet materials but that still often involves linkages to particular web sources.

The weblog format provides the opportunity for individuals ("bloggers") to create and share annotated records of their critical reflections on the Internet over time. Distance education instructors and other educators who are looking for ways to stimulate critical thinking can employ weblogs in student exercises and encourage students to read and comment on each other's weblogs. The process of weblog construction can foster the development of a distinct, discriminating voice in the context of Internet materials related to a particular subject. In contrast to computer conferencing, bloggers maintain their own unique thread of discourse; however, bloggers generally reference and react to each others' reflections, thus allowing for some forms of interaction. This juxtaposition between parallel development of weblog material and co-production of interblog discourse can enable students to expand their repertoire of critical thinking skills.

Educators can also encourage students to read and critique weblogs that are constructed by individuals outside of their specific classroom contexts. Thousands of weblogs are being maintained across the globe, and "metalogs" are available that can link students with weblogs on relevant topics.

Facilitating Multi-Modal Interaction in Distance Education Contexts

Distance education via the Internet provides the opportunity for introducing new modes of interaction into learning contexts. However, many distance teaching and learning initiatives have utilized only a few vehicles of interaction-- including threaded discussion groups, e-mail exchanges, simulations, etc.—rather than exploring a wider range of on-line modes. The applications emphasized in this presentation (collaborative filtering and weblogs) present forms of interaction that allow for kinds of group intellectual exchange (as threaded discussions do). However, they also emphasize the importance of individual contribution in powerful and creative ways. These applications are especially useful in stimulating critical thinking and encouraging the development of individual perspectives. They also raise important questions about the emotional and ethical dimensions of distance education, as well as evaluation issues.

In many collaborative filtering and weblog contexts, a few individuals tend to excel—that is, have reputational ratings that are extraordinarily high or produce weblogs that are far more popular than others. Distance education instructors will have to deal with these issues of difference in student outcomes, difference that will be open and obvious to everyone involved (unlike many other forms of student evaluation). Students are often reticent to evaluate the quality of each other's ideas; however, such evaluations are an essential aspect of collaborative filtering and weblog development. Also, the students who excel in critiquing each other and evaluating web materials may not be the same as those who excel at other, more familiar forms of intellectual endeavor (such as multiple choice exams and other structured evaluation exercises), which can provide disquiet.

In recent years, classroom interaction standards (in both on-line and face-to-face contexts) have generally emphasized acceptance of others' intellectual products, rather than encouraged open evaluation and criticism. Distance education students may come from cultural settings in which openly expressed forms of intellectual critique are strongly discouraged, which also increases the complexity of these issues. Educators who utilize collaborative filtering and weblogs in classroom contexts should advise their students about the basic shifts in educational and cultural perspective that the systems can engender; they should also watch for emotional problems that may emerge, as well as disputes about the fairness of student-conducted evaluations. Issues involving emotion are often neglected in instructional systems design, in part because they may be seen to "interfere with the achievement of important cognitive or motivational objectives" (Astleitner & Leutner, 2000). However, emotional issues may indeed be critical to the success of these non-traditional, multi-modal ventures.

Some Conclusions and Reflections

Both weblogs and collaborative filtering have the potential for giving distance educators and students some new, specialized tools for various kinds of intellectual explorations. As the range of distinct modes of on-line interaction grows, educators should share with each other their experiences: what kinds of discussion topics work best with what modes of interaction? How does one deal with the emotional aspects related to large differences in academic performance? These applications are emerging in many workplace and on-line community settings (and in "collabversity" contexts), so students' acquaintance with them can provide important benefits. Distance educators who are flexible in their ability to facilitate various modes of interaction—tailoring each on-line presentation to fit content and participant considerations—an aid students in their development of critical thinking skills and overall quests for knowledge.

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Biographical Sketch

Jo Ann Oravec is an Associate Professor in the College of Business and Economics, University of Wisconsin-Whitewater. She has an M.B.A., M.A., M.S. and Ph.D. from UW-Madison. She taught at Baruch College of CUNY and in the School of Business and Computer Sciences Department (artificial intelligence area) at UW-Madison. She was chair of the Privacy Council of the State of Wisconsin, the nation's first state-level council dealing with information technology and privacy. She wrote *Virtual Individuals, Virtual Groups: Human Dimensions of Groupware and Computer Networking* (Cambridge University Press, 1996) and two other academic books, as well as over thirty peer-reviewed articles and special issues.

Address: P.O. Box 481
Whitewater, WI 53190
E-mail: oravecj@mail.uww.edu
URL: www.collabversity.com
Phone: (262) 472-5578
Fax: (262) 472-4863

Lessons From the Cyberspace Classroom

Rena M. Palloff, Ph.D.
Crossroads Consulting Group and The Fielding Institute
Alameda, CA

Keith Pratt, Ph.D.
Datatel, Inc. and Crossroads Consulting Group
Oklahoma City, OK

Online Distance Learning: More of the Same?

Institutions are rushing to get in on the distance learning craze, many for the wrong reasons. Administrators see it as a way to increase flagging enrollments and extend the reach of the institution or, in simple terms, an easy way to maximize profits. They believe that they will attract students from far beyond their current geographic reach. They also believe that they will save money by not needing as many classrooms and even as many faculty. All faculty need to do is to post their lectures online, right? How difficult can that be?

Many students see online courses as a more convenient way to go to school and even sometimes as a softer, easier way to earn credit. Faculty, however, given the responsibility to develop and teach online courses may not see online education in such a positive light. As they struggle to move materials and pedagogy to the web, faculty complain in ever increasing numbers about the time it takes to effectively teach an online course—a complaint that often goes unheeded.

Regardless of the motivation to engage in online teaching and learning, the use of instructional technology in higher education is having a significant impact in a number of ways. The impacts fall into four broad categories:

- Faculty/Institutional (or administrative) Relationships
- Faculty/Student Relationships
- Student/Institutional Relationships
- How Education is Delivered and Learning Happens

We will now review each of these categories in brief and conclude with the lessons learned from the problems and successes encountered in online learning.

Faculty/Institutional Relationships

One of the major issues facing faculty and their institutions as they prepare to teach online is compensation. Because we know that it takes approximately three times as long to prepare for and teach an online course (Palloff & Pratt, 1999), the question regarding equitable compensation surfaces. At many institutions, faculty are offered incentives for the development of online courses, in the form of stipends, reduced course loads, reimbursement for attending conferences on the topic of online teaching and learning, sabbaticals, etc. However, there are still many institutions where online teaching is considered simply a part of the overall course load or, worse yet, is considered an overload and treated as such. Related to the issue of compensation is that of promotion and tenure. Online teaching is still not treated as scholarly work, although preparing an online course is often likened to writing a textbook on a given topic. Course ownership is another issue that is being hotly debated—who owns a course that has been prepared by a member of the faculty of an institution and taught online, especially if that faculty member has received a stipend for its preparation? There are no easy answers to the questions that surface regarding these issues. However, with good planning and policymaking at the institutional level, problems in these areas can be avoided.

Faculty/Student Relationships

It has been noted in research regarding the students who enroll in online courses, that the online student tends to be a mid-career adult returning to school (Hammonds, Jackson, DeGeorge, and Morris, 1997). The increasingly non-traditional student with life and career experience is not satisfied with a traditional approach to them as students (Carr, 2000) . They tend to return to school with career goals in mind and a directed course of study to get them there. Thus, the more typical online student is seeking an active approach to learning and more involvement in the learning process itself. Not content with being *taught to*, the online student seeks to engage with faculty in a more collaborative learning partnership resulting in the achievement of their learning objectives (Palloff and Pratt, 2001). Consequently, the faculty-centered approach found at many institutions of higher education must give way to a more learner-center approach.

Student/Institution Relationships

The demand from online students for increased involvement and responsiveness goes beyond their relationships with faculty to relationships with the institutions in which they enroll. Because they are not on campus and generally have little interest in campus life per se, the needs of the online student are different, but equally in need of attention. Issues such as ease of registration, integration of admission functions, access to library services, and access to advising all must be addressed by the institution in order to effectively retain online students in courses and programs. When their needs are not addressed, online students can become disgruntled and withdraw. Although no comprehensive research exists to date that describes retention issues with online students, it can be assumed that if a solid connection is forged with the institution through the provision of services at a distance, students will be more likely to stay in their online courses and programs.

How Education Is Delivered and Learning Happens

The major impact of online education, and the area in which we are seeing the greatest amount of change, is in the area of teaching and learning. The online environment is conducive to an interactive, collaborative, facilitated approach wherein the instructor acts as a guide to the process rather than its director. By paying attention to the development of a learning community, the instructor creates the vehicle through which the learning happens (Palloff and Pratt, 1999; Palloff and Pratt, 2001). Through the development of a learning community, students learn that their greatest and most profound learning comes through reflection and interaction with one another. Dependence on the instructor is reduced and students are empowered to take responsibility for their own learning.

Lessons Learned

As more institutions and their instructors enter the cyberspace classroom and encounter both successes and difficulties in the process, they are coming face-to-face with the realities of online teaching and asking more, not fewer, questions about how to make the transition to this environment successfully. What, then, are the lessons learned from the experiences and noted changes that are occurring as the result of the implementation of online distance learning? How can institutions and instructors more effectively deliver instruction online? And lastly, but probably most important, how can students become effective online learners? The following are suggestions that address these questions:

- **Course development should focus on facilitation and interactivity rather than content.** Often, we are asked how instructors can "teach" the content that is the core of the class. Our response is to reframe the way in which content is delivered. When students are encouraged to embark on a process of discovery with one another, rather than being told what they need to memorize or know, the outcome is a deepening of the learning experience and satisfactory achievement of learning objectives. In general, when students evaluate a class, it is the interactions that they have had with the instructor and with other students that they often cite as the most important aspect of the class (Phipps and Merisotis, 1999). For the online student, this is where the learning occurs.

- **Faculty and student roles need to change.** In order for a high degree of interactivity to occur in a course, faculty need to let go of the control of the course and empower students to take responsibility for the learning process. For this to happen successfully, students need to be oriented to the differences in learning online. A good student orientation to the online environment would include not only training in the courseware used, but also the difference in the role of the instructor and the expectations of the student as a learner. We cannot expect that students will simply know how to learn online or that faculty will know how to teach in this environment. Training for both is essential.

- **Adequate support for faculty and students must be provided.** Many institutions are engaging in creative ways to meet this important need, such as using students to staff a help desk 24/7 or by outsourcing technical support. Regardless of how it is offered, support for both students and faculty is critical to the success of an online course or program. There is nothing more frustrating to a student who is working late at night than to be unable to access the course site. If and when this occurs, help needs to be available.

- **Good institutional planning is critical to the success of online courses and programs.** Rather than simply jumping on the bandwagon with little to no infrastructure, institutions need to engage in an inclusive planning process to address: Policy issues such as faculty compensation and course ownership; infrastructure issues such as the purchase of servers and courseware; the provision of training and support; and the future of online courses and programs in that institution, including a budget that allows for growth and development.

The Challenges

By slowing the process and paying attention to issues of quality, involvement, and empowerment, institutions and their faculties can develop effective online courses and programs that help to develop a culture of lifelong learning for all involved. As James Duderstadt (1999) notes, "Today's technology is rapidly breaking the constraints of space and time. It has become clear that most people, in most areas, can learn—and learn well—using asynchronous learning (that is 'anytime, anyplace, anywhere' education) . . . Lifetime education is becoming a reality, making learning available for anyone who wants to learn, at the time and place of their choice, without great personal effort or cost. . . . Rather than an 'age of knowledge,' could we instead aspire to a 'culture of learning,' in which people are continually surrounded by, immersed in, and absorbed in learning experiences? . . . This may become not only the great challenge but the compelling vision facing higher education as it enters the next millennium" (pp. 24-25).

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Biographical Sketches

Rena Palloff, Ph.D. is a member of the faculty of the Fielding Institute, teaching in their completely online masters degree program in Organizational Management and Capella University, teaching in the School of Education. She is also an Assistant Professor at John F. Kennedy University, teaching in the Graduate School for Holistic Studies, an adjunct Associate Professor in the Chemical Dependency Studies Department at California State University-Hayward, and an adjunct professor in Samuel Merritt College's program in Health and Human Sciences.

Keith Pratt, Ph.D. is a Project Manager for Datatel. Keith also teaches at the Fielding Institute, Capella University, California State University-Hayward, John F. Kennedy University, and Samuel Merritt College. In addition, Rena and Keith are the managing partners of Crossroads Consulting Group and the authors of the Frandson Award winning book *Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom (Jossey-Bass, 1999)* and *Lessons from the Cyberspace Classroom: The Realities of Online Teaching (Jossey-Bass, 2001).* The books are based on their many years of teaching experience in the online environment and contain vignettes and case examples from a variety of successful online courses. Drs. Palloff and Pratt have been presenting this work across the United States and internationally since 1994.

Addresses: Crossroads Consulting Group
206 Lagunaria Lane
Alameda, CA 94502
E-mail: rpalloff@mindspring.com
drkpratt@mindspring.com
URL: www.xroadsgroup.com
(510) 769-1340

Getting Straight A's: Effective Mentoring in Distance Learning Programs

Dr. Gloria Pickar
Chief Educational Officer and Dean
Compass Knowledge Group

Dr. Cynthia Wheatley
Senior Higher Education Consultant
Campus Pipeline

The Distance Learning Experience

Distance education classes, whether in corporate training or higher education, have alarmingly high attrition rates. The problem is widespread and costly for organizations and institutions that have invested heavily in distance learning strategies in the hopes of serving larger audiences with fewer resources. Part of the problem lies in the allure of online learning itself: the opportunity to learn anytime, anywhere, putting the control of the learning experience in the hands of the students. More and more course content is available to students in a completely asynchronous format that they can access at their own pace and schedule. While this format is attractive to students and faculty alike, it typically leads to low completion rates and low student satisfaction. While it appeals to the students' desire for convenience, it does not satisfy their various learning styles or need for interaction.

Designers of distance learning programs must consider the profile of the non-traditional student as they create online courses. Individuals taking distance learning courses are typically working professionals with job and family demands. They have more life experience to bring to their classes and want to immediately apply the knowledge they gain. They are typically not as patient (or enamored) with technology as 18-25 year olds. They can also think on multiple levels and bring a healthy skepticism for theory that is disconnected from real world evidence.

Considering these characteristics, it follows that adult learners in distance education courses respond better to structure than to the self-paced model. They want to discuss ideas and share experiences with a learning group rather than process information in isolation. They want reflective, open-ended assignments rather than tests and quizzes. They want knowledgeable faculty who know the real-world application of the course content rather than just theory. Learning activities need to engage them at the same conceptual and practical levels at which they operate everyday. They want technology that is transparent, not the latest bells and whistles. What keeps adult learners engaged in distance education is a learning experience where they are guided, not taught. In a word, they need to be *mentored.*

Role of the Facilitator-Mentor

Currently faculty roles in distance learning courses fall into one of two categories: the traditional instructor who dispenses information and responds to assignments, or the mentor who provides support and motivation for students as they make their way through course material. Each of these roles has its limitations. The traditional instructor provides too little interaction with students one-on-one, and the mentor provides too little instruction. The successful role lies in between these two: the facilitator-mentor.

Facilitator-mentors are responsible for delivering a *transformative* learning experience for each student in a learning group. Ideally, they bring academic, practitioner, and customer service perspectives to the role.

Facilitator-mentors guide students' thinking process as they negotiate course assignments, always challenging them to think on multiple levels. They purposefully manage all group and individual communication to encourage and challenge new approaches to the course material and interaction among peers. Facilitator-mentors maintain one-on-one contact with each student to offer advice or motivation, as well as encouraging peer mentoring. They represent the outcome the students want to achieve: the reflective practitioner.

For an organization or institution, the keys to ensuring the successful fulfillment of the facilitator-mentor role are structure and training. We have identified five critical components of this role:

1. **Advisement:** Mentoring begins during the advisement period when students are seeking not only information but also comfort. During advising the mentor-facilitator is establishing a relationship with the student, discovering his or her unique needs, building trust, and managing expectations. As Laurent Daloz has aptly stated, "Knowing what is important to our students as individuals, we can more readily help them find connections between the lives they live and the subjects we teach" (111). The facilitator-mentor should make contact with each student before the course begins, or during the first week, and establish a relationship of trust and credibility from the outset.
2. **Accountability:** The facilitator-mentor must be held accountable for more than dispensing grades. She should also be accountable for the students' learning experience in all aspects of the course. In a distance learning course this includes monitoring all group communications (chat sessions and discussion forums), communicating with each student weekly, responding constructively to all student postings, and facilitating group activities. Even though discussion is built into the course design, facilitator-mentors monitor group discussions, both synchronous and asynchronous, to constantly encourage critical and practical thinking. Likewise, students are evaluated on group participation, quality of online communications, and critical thinking.
3. **Alignment:** The role of the facilitator-mentor must be aligned with goals of the course. These goals will vary depending on the nature of the course, so the facilitator-mentor role must remain flexible to adapt to the needs of the students. For example, theoretical/historical courses require different thought processes than skills-based courses. Not only are these courses different in design from one another, but also in the ways that students interact with their facilitator-mentor and peers.
4. **Application:** Students in a distance learning course are predominately working professionals who have an immediate need for the knowledge and skills they are acquiring. They demand that courses are designed and instructed toward this end. Effective facilitator-mentors have practical experience in the subject they are instructing and bring those practical experiences into their discussions with students. They are also adept at pulling out of students their own experiences in order to evaluate them in light of research and others' perspectives.
5. **Affiliation:** Distance education courses must bridge the social gap created by the absence of the face-to-face classroom experience. The primary reasons students drop out of self-paced courses are a lack of interaction others and lack of motivation. The facilitator-mentor must feel responsible for establishing and maintaining relationships with and among the students in a virtual learning group. Students need to feel cared for and that they can talk with the facilitator-mentor about their learning experience as well as the course material.

Getting Straight A's

When properly structured and implemented, the facilitator-mentor model for distance education courses earns more than straight A's—it earns high completion and high student satisfaction rates. The learning group and facilitator mentor provide the much-needed support and structure that distance learning students need in order to manage the demands of rigorous courses, careers, and family lives—all of which are reasons to drop out. This learning community *pushes* the student through requirements of distance learning while the mentor *pulls* them through to the desired outcome. Programs with this model enjoy high student retention and high completion rates. But most of all they truly are the best of both worlds: high quality learning experiences and convenient delivery that surprise and delight students and faculty alike.

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Biographical Sketches

Dr. Gloria Pickar is the Chief Education Officer and Dean of Compass Knowledge Group, a distance education company that partners with institutions of higher education to deliver online degree programs to working professionals. Before joining Compass Knowledge Group Dr. Pickar served as a Dean at Seminole Community College responsible for corporate training and continuing education. She earned her Ed. D. from the University of Florida in 1996. Dr. Pickar has made presentations to state and national professional associations, including the Florida and American Nurses Association and the League for Innovation in Community Colleges and authored two nursing textbooks published by Thomson Learning.

Address: 2704 Rew Circle Suite 105
Ocoee, FL 34761
E-mail: gpickar@compassknowledge.com
Phone: (407) 573-2000 Ext 324

Dr. Cynthia Wheatley is a Senior Higher Education Consultant with Campus Pipeline, a company that provides technology and services to assist colleges and universities in creating a digital campus. Before joining Campus Pipeline she was an Academic Systems Director for Compass Knowledge Group. She also worked at Disney Institute as a sales manager in their professional development programs division. She earned her Ph.D. in Literature from Florida State University in 1993. Cynthia has done keynote speeches and workshops for the American Association of Collegiate Registrars and Admissions Officers, IBM Best Practices Forum, Council of Independent Colleges, Wyoming Community Colleges, Instructional Systems Association, and Meeting Professionals International. She has also co-authored articles on leadership and branding in *Training & Development* magazine and has contributed a chapter in the forthcoming *Innovation in Student Services: Planning for Models Blending High Touch/High Tech* published by IBM.

Using the Case Method in Distributed Environments: Opportunities and Challenges

Joshua Powers
Assistant Professor of Educational Leadership,
Administration and Foundations
Indiana State University

Joanne Burrows
Program Chair & Assistant Professor of
Educational Leadership, Administration and Foundations
Indiana State University

Susan Powers
Associate Professor of Curriculum, Instruction, and
Media Technology
Indiana State University

In recent years, institutions of higher education have come under increasing external pressure to enhance the quality of teaching, particularly at the undergraduate level. One way that some faculty within higher education have sought to be more accountable for their instruction is to embrace a student-centered rather than an instructor-centered model of teaching. The student-centered approach involves a philosophical belief that the purpose of higher education is not to transmit knowledge, but to create environments that allow learners to discover and construct knowledge for themselves (Barr & Tagg, 1995). In contrast with the traditional instructor-centered paradigm in which a college is assumed to exist to provide instruction, the learning-centered model sees the purpose of the institution as producing learning.

Within the student-centered framework, the use of active learning techniques is critically important. Active learning approaches are undergirded by the belief that learning is best facilitated when knowledge and meaning can be engaged through experimentation, exploration, and the manipulation and testing of ideas (Meyers & Jones, 1993). One active learning technique that has proven especially successful is the use of case studies or what is known as the case method. From its likely birthplace at the Harvard Law School in 1870, case method teaching has come to be widely used in multiple disciplines, particularly for the education and training of pre-professional students in the fields of business, public administration, medicine, and education among others (Kimball, 1995). Christensen and Hansen (1987) capture the essence of case methodology or case studies in the following way:

> A case is a partial, historical, clinical study of a situation that has confronted a practicing administrator or management group. Presented in narrative form to encourage student involvement, it provides data – substantive and process – essential to an analysis of a specific situation, for the framing of alternative action programs, and for their implementation recognizing the complexity and ambiguity of the practical world. (p. 27)

Simply put, "A teaching case is a story, describing or based on actual events and circumstances, that is told with a definite teaching purpose in mind and that rewards careful study and analysis" (Lynn, 1999, 42). Thus, cases provide students with a simulation of reality built around a realistic problem confronting a person or persons within their field of practice. Students, then, are challenged to analyze the issues involved and bring to bear knowledge and theory learned in class to the problem or dilemma at hand. A skillful instructor guides the students through the case in ways that challenge them to surface the issues, to discern those that are most salient, to see solution alternatives, and ultimately to take action steps to address or to solve one or more problems presented in the case. Lynn (1999, p. 44) offers a useful summary of the core elements of case-based teaching:

- Case teaching is discussion based.
- The teacher knows more than the students, but the teacher's knowledge is not definitive; students are expected to contribute to their own learning.
- Both the teacher and the student assume responsibility for the student's learning; knowledge and ideas flow from teacher to student, from student to teacher, and from student to student.
- The general goal is student competence and confidence in critical and analytical thinking, summarization, argument, and persuasion.
- Students are usually the center of attention; the teacher and students share control over topic selection and mode of discussion, and the teacher is often in the subordinate role of facilitator or resource person.

The Case Method in Distributed Environments and Purpose of Paper

Although the use of cases as a pedagogical tool in traditional classroom settings is not necessarily new, its adaptation for the rapidly emerging distributed environment is a very recent phenomenon. Furthermore, a review of the literature revealed a paucity of research on the use of cases in distance education contexts. What was available was largely descriptive in nature and generally lacking in detail as to practical advice for instructors developing or using cases in either interactive television or web-based contexts. Hence, there is little available to guide the practical development and execution of cases in these kinds of environments. As such, the purpose of this paper is to offer useful insights on the subject from the perspective of persons who have integrated cases into their distance-based classrooms. The comments offered are structured around the use and misuse of cases via distributed education that align with the tenets of active learning and the core elements of case teaching previously articulated.

Using Cases in Distance Environments

As mentioned earlier, case-based teaching can be a powerful active learning tool. By engaging students in the application of course learning to salient real world problems via substantive group discussion, listening and responding to divergent thinking, and engaging in high-levels of reasoning that requires analysis, synthesis, judgment, and evaluation, learning is enhanced in ways far superior to the traditional lecture (Meyers & Jones, 1993). The skillful instructor/facilitator, guides students through a case from relatively simple exploration of facts and issues to deeper investigation of cause and effect relationships and ultimately ownership for informed opinions that can be utilized to formulate problem solving responses.

Unfortunately, much of the success of the case method is predicated on face-to-face engagement between students and the instructor/facilitator. The instructor/facilitator in a traditional classroom can easily ask probing questions, organize students into sub-groups for focused analysis, employ discussion enhancing strategies, and interpret both verbal and non-verbal signals so as to spontaneously change direction or reorient a discussion as needed. Although these central elements of case facilitation can be used in a distance environment, the implementation of them must change. In other words, the student-centered instructor needs to adjust or augment his or her approach to effectively employ the learning benefits of case studies.

To this end, we offer the following pieces of advice for distance-based instructors who wish to effectively integrate the case method into their distance-based learning environments:

1. Increase the emphasis on advanced case reading and detailed instructions.

Often an instructor teaching a case in a traditional context can get away with simply having students read a case in advance, and if short enough, having them read it when they arrive in class. In a synchronous distance-based class such as with interactive television, unless the case is short enough to fit in its entirety on the television screen, students must have it immediately in front of them so that they can refer to particular sections as needed or as the discussion warrants. Furthermore, if students are to be broken into small groups to engage an aspect of the case or to participate in a role play, they need to clearly understand how that is to occur (e.g., internet chat room, telephone conference call). As it regards the asynchronous setting (e.g., electronic discussion forum), students need explicit directions as to when the case discussion will begin, for how long, and in what way they are expected to participate. Since good cases by their very nature simulate reality in all of its messy complexity, heightening student anxiety unnecessarily around the mechanics of the case exercise in a situation where the instructor is physically absent is unwise.

2. Structure small group work carefully.

Of key importance to the successful case teaching experience is the ability to stimulate student-to-student interaction in ways that provide a comfortable environment to test thoughts and opinions. One proven technique is to form smaller student groups where each person is encouraged to share and/or intentionally directed to engage the material in a particular manner (e.g., simulating a particular stakeholder perspective, adopting a persona, offering a pro or con position). In a distance based environment, students may feel a lower level of accountability for participating or a heightened sense of confusion as to what is expected (and hence, may be more likely to disengage than in a traditional classroom). As such, right from the start of the course, the instructor needs to establish a supportive and respectful class climate where openness to participation becomes the norm. Building from that foundation, when conducting a case, the instructor needs to be intentional about how groups are structured and may want to assign specific roles (e.g., team leader, idea synthesizer, reflective observer, summarizer, etc.) to ensure that interaction is maximized despite the absence of face-to-face proximity.

3. Employ other mediums to enhance the saliency of the case.

In a sense, traditional case studies, whether facilitated in a face-to-face classroom or via distributed education, are both unidimensional. In other words, the case is something that students read and then respond to in a particular manner structured by the instructor/facilitator. In the distance mediums, however, a unique opportunity exists to make them multidimensional by augmenting the content with other material. For example, students could be asked to do targeted web-searches of similar situations in advance of the class session or even as part of the facilitation experience to gain perspective on the issues or as a means of developing solution alternatives. Furthermore, the use of videoclips, a growing practice in teacher education for instance, offers a greater sense of realism and recognition that the issues are not contrived. Lastly, the most sophisticated kinds of cases now available are truly interactive and available either on-line or via CD-ROM. In this kind of case, students are provided textual, graphical, and/or video-based information, may be given personalized feedback based on decision choices, and possibly even presented with time-revealed scenarios in which aspects of the case only become known over time just as they might be in a real situation. In sum, given that distance-based teaching environments by definition require students to use technology, further enhancement of the case experience can be more seamless and learning powerful.

4. Resist the urge to insert your own opinions, particularly early in the discussion.

In the traditional teacher-centered classroom, students look to the instructor for expert knowledge and thus, interaction, if it occurs at all, is generally from student to teacher and visa-versa. The case method, by contrast, seeks to empower student-to-student interaction and instill in them a sense that they too possess expert knowledge that can be brought to bear on a problem. Achieving student-to-student engagement where they feel free to float an opinion, challenge a classmate, and/or offer a solution option requires considerable effort on the instructor's part, however. One of the fastest ways to undermine the power of student interaction, especially in a distance medium where students may already be quick to defer to the instructor, is to offer your opinion on a case element or solution, at least early in the process. Since pauses of silence can be longer in distributed mediums (e.g., dead air on television, dead time on a computer chat room, time delays in electronic discussions), the urge to step in and offer and opinion or be more directive about the case direction is greater for the instructor/facilitator than the traditional classroom. Students need time to process information and as such, the instructor/facilitator's role should allow them this opportunity. When talking, use it strategically to move the conversation forward such as through a softball question, summarizing or synthesizing what had been shared, playing devil's advocate, and/or affirming a minority opinion that may in fact have merit but the students were not seeing it yet.

5. Initial up front preparation for instructor and students new to these mediums may be more intensive but largely disappear with experience.

In our view, the planning and execution needs of cases in distributed environments can be initially more complex and hence time intensive. Not only do the facilitation elements require more careful forethought, but also the pace is slowed by the need to either type responses to an ongoing dialogue (e.g., a chat room or discussion forum) or "click-in" to an interactive television-based conversation. Furthermore, the ability to "read" students (and for that matter, for students to "read" each other) through non-verbals is greatly reduced or even completely lost, necessitating more deliberate care in following and skillfully directing the course of discussion. For students, they need more advance direction on how to participate and engage, especially when smaller break-out groups are involved, and time to do so. Nevertheless, with careful planning and practice, the benefits of using cases in distance contexts can be substantial and the preparation time required by veteran students and instructor/facilitators largely mirroring that of case exercises in traditional classroom settings.

Conclusion

In his noteworthy book on teaching, Wilbert McKeachie (1999) offers the following advice for educators:

> What is important is learning, not teaching. Teaching effectiveness depends not on what the teacher does, but rather on what the student does. Teaching involves listening as much as talking … They [students] hold expectations, experiences, and conceptions that will shape their interpretation of the knowledge you present. (p. 6)

Given the increased emphasis on student-centered learning and the rapid rise of teaching in distributed-mediums, this advice is especially sage. As we discussed, case studies are one way that student learning can be enhanced but particular care must be employed in order to realize its benefits in distributed environments. What a student does or gains from this pedagogical tool is affected by the skill with which the instructor adapts what works in traditional settings to the unique challenges of distance ones.

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Biographical Sketches

Dr. Joshua Powers brings dual expertise in the areas of case-based learning and design as well as teaching in a distance education environment. Dr. Powers is on the faculty at Indiana State University where he teaches in a hybrid distributed/traditional cohort-based doctoral program. With a Ph.D. in business and higher education from Indiana University, Dr. Powers was able to integrate his experience using cases, a common pedagogical tool in business, with his interests in distributed learning.

Address: Department of Educational Leadership, Administration and Foundations
Indiana State University – School of Education
Terre Haute, IN 47809
E-mail: jopowers@indstate.edu
Phone: (812) 237-3862

Dr. Joanne Burrows also brings dual expertise in the areas of case-based learning and design as well as teaching in a distance education environment. A graduate of The Ohio State University, Dr. Burrows currently coordinates and teaches in the same hybrid distributed/traditional cohort-based doctoral program as Dr. Powers. Dr. Burrows uses case studies both as instructional vehicles and learning assessment tools in her courses. She introduced the practice of using case studies as the format for doctoral preliminary exams.

Address: Department of Educational Leadership, Administration and Foundations
Indiana State University – School of Education
Terre Haute, IN 47809
E-mail: jburrows@indstate.edu
Phone: (812) 237-2903

Dr. Susan Powers has been an online instructor for five years including for a course entitled the "Technology of Distance Learning." Additionally, she is an active presenter at campus workshops for faculty development, has presented extensively at regional and national conferences, has a number of book chapters and articles related to technology and education, and is a co-author of a forthcoming book with Haughton Mifflin on technology and teacher education. Dr. Powers has a doctorate from the University of Virginia.

Address: Department of Curriculum, Instruction, and Media Technology
Indiana State University – School of Education
Terre Haute, IN 47809
E-mail: espowers@indstate.edu
Phone: (812) 237-2946

Creating Authentic Learning Environments on the Web:
On-Line Case Authoring for Faculty

Anju Relan, PhD
Director, Instructional Design and Technology Unit
School of Medicine, UCLA

The purpose of this paper is to discuss the objectives, characteristics and structure of a case authoring tool developed and evaluated in a medical school. The tool tests the interactive potential of the Web in providing effective, authentic learning environments for clinical reasoning. Although it is primarily targeted towards medical students and clinical faculty, the design allows for the generation of problem solving cases in diverse specialties.

Background and Rationale

The Web is presently a significant medium of content delivery in medical schools. The School of Medicine at UCLA is no exception, with a large repertoire of highly interactive, web based applications illustrating concepts, procedures, and problem solving objectives via multimedia or virtual reality presentations, in open ended or program controlled formats. However, this is largely true of the first two years of medical school, with relatively few opportunities for interactive learning during students' critical clinical experiences in the final two years. This formed an overriding concern for the development of case based learning opportunities. A needs analysis via faculty meetings was undertaken to identify reasons for robust development of web based cases. The following concerns emerged as significant determinants for proceeding with the development:

- It was difficult to "capture" student experiences in clinics spread all over the metropolitan Los Angeles area. While the curriculum specified common problems that students needed to see in clinics, students were unable to reproduce their clinical experiences for assessment and evaluation.
- The chronological split between basic sciences and clinical years necessitated that practice opportunities to integrate the two were critical to hone clinical reasoning skills.
- Inadequate expert feedback to students on site by clinical faculty could be addressed by ensuring that appropriate feedback was made available via the cases.
- Both common and unique cases could be provided in order to standardize the problems students would see.
- Practice for the board exams, which are increasingly incorporating patient simulations for assessment could be effectively provided via the simulated cases.

Although practical considerations cited above provided an adequate rationale for the development of simulated cases, cognitive reasons for supporting the development of the tool overshadowed these. Participating faculty unanimously believed that simulated web based cases offered a powerful scaffolding strategy for the development of clinical reasoning skills (Felciano, et. al, 1994; Friedman, 1995; Jonassen, 1996).

The discussions with faculty centered not only on benefits of case based learning accruing to students, but also on the process of developing a case bank. One objective was to make the process of development transparent to all clinical faculty interested in generating cases, irrespective of their knowledge of web programming. Consequently, an authoring interface for case based learning was proposed, as illustrated in Figure 1.

Figure 1. Structure of the Case Authoring Tool

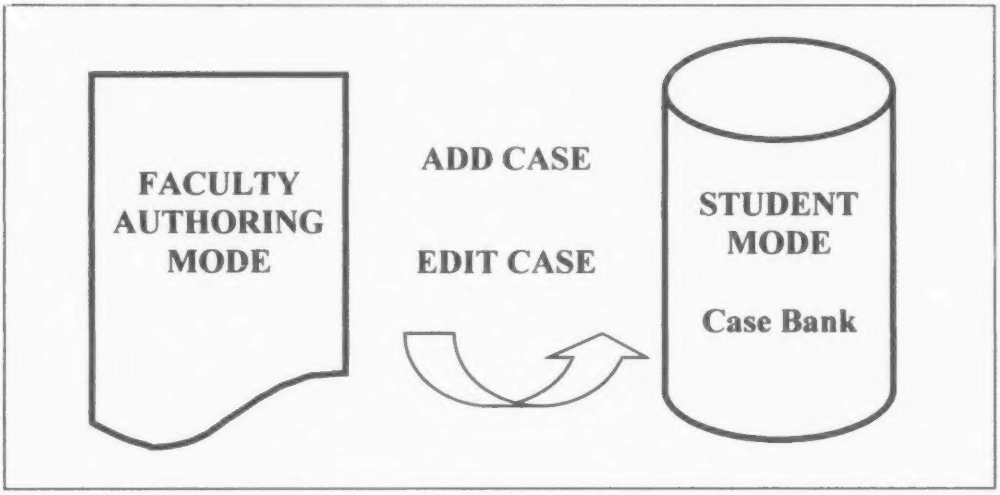

FACULTY AUTHORING MODE
ADD CASE
EDIT CASE
STUDENT MODE
Case Bank

Figure 2. Components of the Case Authoring Tool

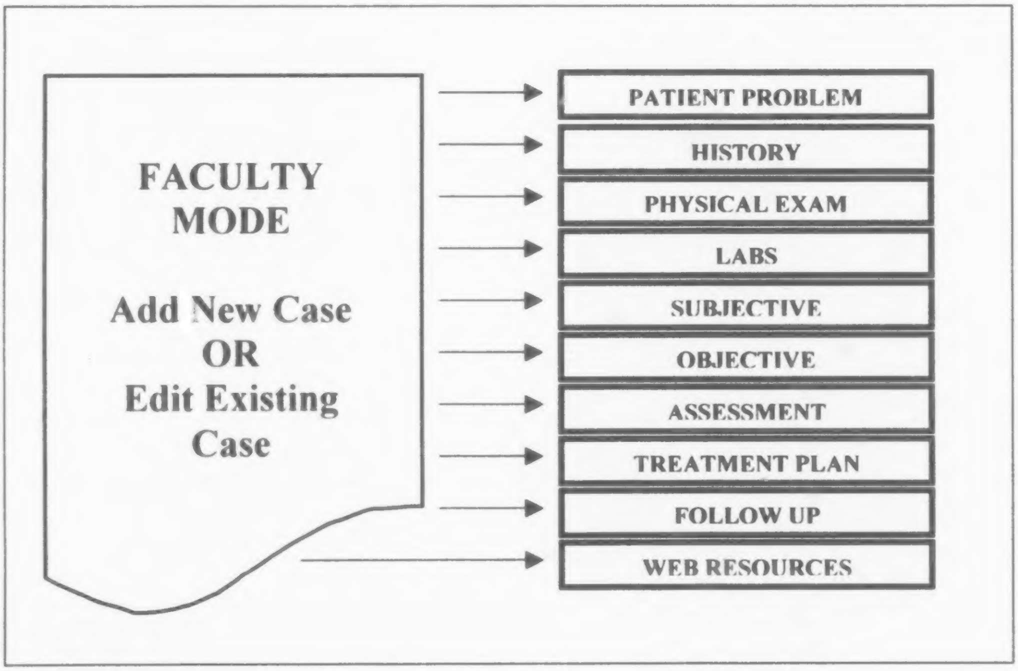
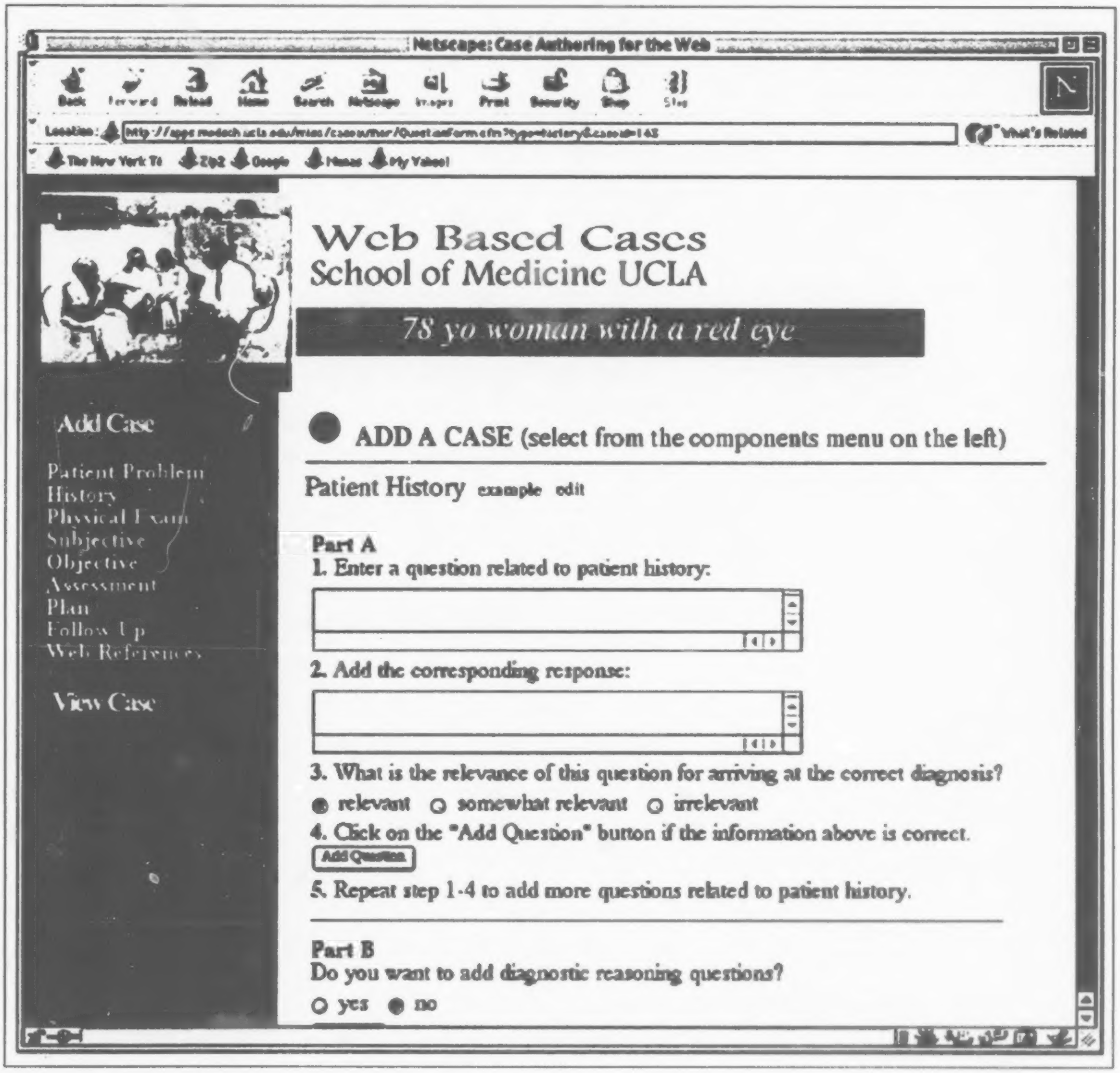

FACULTY MODE
Add New Case OR Edit Existing Case
PATIENT PROBLEM
HISTORY
PHYSICAL EXAM
LABS
SUBJECTIVE
OBJECTIVE
ASSESSMENT
TREATMENT PLAN
FOLLOW UP
WEB RESOURCES

Figure 3. An Example of Case Authoring Interface for Patient History


Netscape: Case Authoring for the Web
Back
Forward
Reload
Home
Search
Netscape
Images
Print
Security
Shop
Stop
Location:
What's Related
The New York Ti
Zip2
Google
Menus
My Yahoo!
Web Based Cases
School of Medicine UCLA
78 yo woman with a red eye
Add Case
Patient Problem
History
Physical Exam
Subjective
Objective
Assessment
Plan
Follow Up
Web References
View Case
Add Question

● ADD A CASE (select from the components menu on the left)

Patient History example edit

Part A

1. Enter a question related to patient history:

2. Add the corresponding response:

3. What is the relevance of this question for arriving at the correct diagnosis?

● relevant ○ somewhat relevant ○ irrelevant

4. Click on the "Add Question" button if the information above is correct.

5. Repeat step 1-4 to add more questions related to patient history.

Part B

Do you want to add diagnostic reasoning questions?

○ yes ● no

Methods

The blueprint of a design for the Web based case authoring tool was generated using storyboards. A modular approach to the selection of cases was envisaged, in order to infuse flexibility to the tool. The structure and components of the tool are exemplified in Figure 2.

The case author starts by assembling images, text and external links required for a case. Depending upon the nature of the case details, modular components that would accommodate the content are selected. Information about each component is added via prompts. The option to edit as one enters the case information is available. As individual case components are entered, the case is dynamically added to a

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common case bank. In addition, the student viewing mode is dynamically generated. A sample screen shot of the case authoring interface is presented in Figure 3.

Discussion

An important mission of medical schools is to foment a deeper, more meaningful connection between the basic sciences and clinical reasoning skills, which are taught at different chronological points in the traditional 4-year curriculum. The separation of basic and clinical sciences has been shown to result in inability to access critical knowledge components during the clinical reasoning process, resulting in "inert knowledge" structures. This phenomenon has led medical educators to pursue the development of case simulations to scaffold the processes that experts use in the complex domain of diagnostic reasoning.

The authoring tool described in this paper is one such attempt to improve diagnostic reasoning skills among novice clinicians. The design of the tool, however, is founded upon principles of learning prevalent in problem solving, and can be modified for diverse learning environments. As the case bank develops, the efficacy of this environment can begin to be evaluated.

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Biographical Sketch

Anju Relan is an Assistant Professor of Medicine, and the Director of Instructional Design and Technology Unit at the School of Medicine, University of California, Los Angeles. She earned a degree in Educational Technology from the University of Minnesota in 1991. She assists the medical school faculty in the design and development of instructional web sites related to the 4-year undergraduate curriculum. Her research interests include web based multimedia in education, metacognitive strategies in case based education and the efficacy of handheld devices in the practice of medicine.

Address: 60-051 Center for Health Sciences
School of Medicine, UCLA
Los Angeles, CA 90095
E-mail: arelan@ucla.edu
Phone: (310) 206-0572
Fax: (310) 267-0320

Recruitment and Retention in Successful Distance Learning Programs

Karen Rhoda Ph.D.
Division of Distance Learning, Director
The University of Toledo

James Benjamin Ph.D.
Division of Distance Learning, Associate Director
The University of Toledo

Characteristics of a Successful Distance Learning Program

The success of the distance learning program has been built on a foundation provided by its administrative premise, and by its adherence to quality student services and quality course offerings. The Division of Distance Learning at the University of Toledo operates as a centralized entity to coordinate and facilitate all distance learning courses and degree programs. It provides the coordination of student services for all distance learning students as well as comprehensive technical training for faculty in the development of distance learning courses. Over 95% of the course offerings are online and taught completely at a distance, that is, there is no requirement for students to come to one of the three Toledo campuses.

Its administration is designed to be self supporting; therefore, the salaries, benefits, technical equipment, furnishing and supplies must come from the production of revenue by means of offering distance learning courses and degree programs. The division collaborates with all university departments to offer the colleges' courses via distance learning and returns a net profit to the partnering college.

Today it is a thriving and growing organization that began in 1997 with no start up funding and with no courses in place. Enrollment for the 2000-2001 was 4485 students. For the upcoming academic year enrollment already stands at 3811. Students may enroll from a large variety of courses ranging from philosophy to computer science to business management technology. Course offerings are available from seven colleges with online degree programs as follows:

- Certificate and Associate degree in Business Management Technology
- Computer Science and Engineering Technology partnered with 11 community colleges
- B.A. in Liberal Studies
- Master's in Liberal Studies
- M.S. in Engineering

In addition, the division supports the development and teaching of non-credit courses and programs

The effective administration of an increasing number of course and degree program offerings to an increasingly greater number of students from an increasingly larger geographic area requires a systemized process of operation. Verduin and Clark (1991) emphasize the need for a specific model for success in distance learning programs and Scollin and Tello (1999) point to the framework for understanding the administrative and academic issues in distance learning necessary for success in distance learning. Drawing on that paradigm, success in the University of Toledo's distance learning program is structured by means of an institutional philosophy that integrates student services and technical training for faculty into an effective entity. The focus is on students and faculty rather than on technology alone.

Focus 1: Recruiting and Retaining Students

The phenomenal growth of UT's distance learning courses did not occur simply because we offer the DL courses. It occurred as an outgrowth of comprehensive student support services. The Division provides immediate responses to students' questions, problems and concerns from the coordination of admission and registration to technical questions and problems. The Division mails a letter to each student just before the beginning of the academic term giving complete course instructions. Division telephones are answered and questions answered immediately. This also applies to the DL web site. Complete information is posted with frequently asked questions and email is available for students to receive responses. The Division works hard to promote a feeling of affinity with the University for students wherever they may be.

In an effort to learn more about the growing population of students enrolled in DL courses, we conducted a survey of our Fall 2000 student population and we also regularly hear from our students. Their responses support our hypothesis that comprehensive student services are a necessary component of DL. Other critical factors important in recruiting and retaining students in a distance learning program are focusing on asynchronous formats, assuring quality course content, and ensuring interaction between faculty and students and among students. That is, we are able to promote our courses as quality course offerings equivalent to those taught in the traditional classroom.

Our survey indicated that 45% of DL students were between the ages of 18 and 24 while 55% were over the age of 25. This confirms our hypothesis that many of our distance learning students fall in the nontraditional age group.

When asked if they were also taking courses which met regularly on campus, 84% responded that they were taking courses that met in a traditional format while 16% were exclusively distance learning students.

Our respondents were predominantly employed full time: 58% reported full time employment, while 18% held part-time jobs, and 24% were unemployed.

Fifty-five percent of the respondents had children; 39% were married with children, 12% were single with children, and 4% were divorced with children. Parental responsibilities figured heavily in many respondents' motivation for taking Internet courses. A typical response to the question "Why did you choose a distance learning class as opposed to a course which met regularly on campus?" was "I need to be home with my kids I did not have to find a sitter and could be with them in the evening."

Focus 2: Recruiting and Retaining Faculty

The faculty are the key to a positive student experience in distance learning courses. Therefore, the second major focus of the division is to recruit and retain the most qualified faculty. A primary factor about our DL program is that the vast majority of courses are taught by full time faculty.

In order to recruit faculty into the arena of distance learning, we meet with administrators and faculty within the university to recruit talented faculty. In these sessions we attempt to dispel myths about distance learning such as the false impression that distance learning courses do not allow interaction with students. Another recruiting tool we employ is to provide compensation for the development of the course. If the courses are taught as an overload to the full time load of traditional format courses, extra compensation is provided on a sliding scale based on the number of students enrolled in the distance learning course.

In addition to such incentives, we seek to provide a supportive educational environment for our distance learning faculty. The division offers technical and developmental support from our team of instructional designers, assistant instructional designers, and other technical support personnel. Faculty members have face-to-face, telephone and e-mail contact with the team. Furthermore, we do not abandon the faculty after the courses start. We provide ongoing assistance in refining course materials and technical support for any difficulties the faculty may encounter in the course of the semester.

We offer state of the art computers, leading edge graphic and instructional design, digital video recording services, as well as any specialized technology deemed necessary for a successful teaching experience. The division also sponsors grants through our Summer Fellowship program and financial support for presentation of research on distance learning that they present at their professional organizations.

Efforts at quality control add to the attractiveness of teaching in our distance learning courses. Quality control is assured through three means. First, our courses are predominantly taught by tenure or tenure track faculty. This assures that the courses are developed and taught by experienced faculty with a strong commitment to excellence in teaching.

Second, we assure that distance learning courses are supported by the administration. Our faculty teach courses that have received the written approval of the chair of the department. This assures that the courses are the education equivalent to courses taught in the traditional format. We also maintain a positive relationship with other administrative units including the provost's office, university enrollment officers, and international student affairs. This assures that faculty are acknowledged for their efforts in making the distance learning courses successful.

Third, we have instituted policies about intellectual property rights and course assessment and published these in our Distance Learning Faculty Handbook. For example, we support the university's policy on evaluating courses by assisting departments in adapting their course attitude questionnaires for use in distance learning courses. We also sponsor distance learning faculty roundtables on specialized topics like assessment. Finally, we host an interactive distance learning web site called "The UT Distance Learning Faculty Forum" so that our distance learning faculty can interact with each other, access support documents, and post suggestions and questions for each other.

In summary, recruitment and retention are critical factors in any successful distance learning program. This study explored two dimensions of the issue: recruitment and retention of students and recruitment and retention of faculty. Specific measures undertaken to accomplish those goals were highlighted.

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Biographical Sketch

Karen Rhoda is the Director of the Division of Distance Learning at the University of Toledo

Address: SeaGate Campus-Suite 209
401 Jefferson Avenue
Toledo, OH 43604-1005
E-mail: krhoda@utnet.utoledo.edu
Phone: (419) 321-5130

Jim Benjamin is the Associate Director and Faculty Training Administrator of the Division of Distance Learning at the University of Toledo

Address: SeaGate Campus-Suite 209
401 Jefferson Avenue
Toledo, OH 43604-1005
E-mail: jbenjam@utnet.utoeldo.edu
Phone: (419) 321-5130

Distance Education: What Do Instructors Need?

Dr. Sharon J. Rich
Associate Professor and Chair
Continuing Teacher Education
The University of Western Ontario

The Problems With Online Instruction

Technology assisted instruction offers opportunities for increased flexibility, efficiency in course adaptations and shared dialogue and professional reflection among course participants and instructors (Twigg, 1994). There are specific challenges that require the clarification of the roles and responsibilities of both instructors and course participants in integrating technology with instruction (Willis 1992). As well, factors of inadequate training and difficulty in learning the selected system or software are reported as barriers to usage (Anderson & Joeg 1996). However, as teachers experience innovations *in* technology their notions of teaching *with* technology undergo change. As they accommodate new knowledge, teachers often revert back to the role of novice learner, causing them to rethink how they learned, giving greater insight into their students' learning. This encourages reflection about teaching strategies and authenticity when integrating technology in their own curriculum planning (Caverly, 1997).

Thus it seems that developments in network technology have stimulated a great deal of discussion concurring the promise and limits of distance education. Faculty members and students express concerns about the content, the teaching/learning context and the infrastructure to support the courses. Of these issues the central concern for many faculty and students are the issues surrounding the disappearance of face to face communication. Instructors who value the creation of a classroom climate that fosters trust and invites students to interact with each sometime have difficulty conceptualizing a world in which interaction happens through the mediation of a machine.

Traditional distance education in the form of correspondence courses has been available for several years through Continuing Teacher Education at the University of Western Ontario. In most instances, course evaluations indicated both instructor and student dissatisfaction. Students, themselves professional educators, noted the lack of shared dialogue with colleagues as a primary impediment to exemplary learning.

Instructors too reported that students focused on assignment completion rather than new learning. Further, instructor noted an inability to appropriately advance learning in the traditional distance education model. In other words, the amount and nature of interaction diminished student learning. This finding led to an inquiry about computer mediated instruction to investigate whether online interaction would ameliorate the problems in traditional forms of distance learning noted by both students and instructors.

A Possibility for Change

In this paper I discuss what has been learned about on line teaching from the work that has been done at UWO. The rapid expansion of our program and the involvement of trained teachers both as instructors and as students in the program has made us aware of factors that contribute to the development of a successful on line course. Many researchers (Collis, 1994; Wiburg, 1994) have noted the high drop out rates in distance courses and have suggested a lack of commitment to courses by students and instructors. In our progam in part because of the attention to pedagogical issues in both course development and delivery we have established a retention rate of 90%. Our distance education courses use online and paper-based materials, a web-based source of instructor-created content and a conferencing tool for student - instructor interaction.

Emberly (1996), in discussing aspects of virtual education, notes that an instructor plays a key role in fostering genuine understanding and cautions that "mere cognitive assent to facts, or acquaintanceships formed by accidental combinations of 'virtual' students, is not the same." Creating an online environment that foster interaction and learning is crucial in order to maintain and extend student learning and instructor involvement. A key issue for us has been teaching first course authors then instructors to how to foster on line interaction.

Course Content and Readings

In all of our on line courses, content is divided into five modules, each with a set of readings, assignments and conference tasks. Some students in the courses may be computer neophytes, while others may have some familiarity with the medium. They enroll in the course through a combination of electronic mail and phone in registration. Instructions for text material and getting online are also mailed electronically. If an instructor does not hear from a student online, the student is contacted via by telephone or, private electronic mail to determine whether there are problems in accessing the course site.

The conferring system is asynchronous. The instructor establishes a series of "rooms" some of which are related to specific module content, some may relate to student group work or to issues which cross topics boundaries, while still others may foster informal classroom interaction. Each student has access to all of the information posted in a specific location and thus reads the postings of colleagues and faculty. Because each posting is visible to all students, the interaction is much like that in a face to face classroom in which all students are privy to the conversation. The instructor ands students also have access to private electronic mail from the conference itself so that the students can initiate a private conversation with each other as well as with the instructor. The instructor can also monitor students' use of the conference and attention to each item posted. From the conference, students and instructor can move easily to the protected course web site and both students and instructor can establish hotlinks to other areas of the web.

What Is the Nature of Online Interaction?

Electronic discourse is a relatively new form of language and has embedded within it its own set of possibilities and limitations. On the one hand computer conferring seems to be like written language in that the writer has time to be deliberate because the writer has the time to plan and organize the discourse. On the other hand, elements are like oral language in that there are disfluencies and markers of personal involvement. Online discourse is evolving and redefining the parameters of interaction in ways that have not previously been considered. Any one who researches in language notes that speech is produce on the fly and capturing such discourse is at best problematic. On the other hand written language is formalized and reflects a complexity and care that is not evident in oral language. Conventions of print sometimes inhibit a learner's display of knowledge. The complex subordinate clauses of academic writing are removed from the immediacy of speech.

From our initial work with on line communication, we have learned that the discourse that emerges seems to be an amalgam of written and spoken discourses in which students and instructors alike are struggling to find a suitable mechanism for creating a classroom community (Rich & Woolfe, 2001). An unexpected by product of the interaction is that instructors have to judge how effectively students are able to communicate using what is in effect "written talk." Further we have learned that instructors must be also able to give up notions of being teacher centered and move towards a student centered mode of instruction.

Moving from a teacher-centered mode of communication to a student centered mode of interaction implies that in online interaction, the teacher becomes a facilitator as opposed to a stand-and deliver instructor. An ineffective online instructor supports an environment where the teacher imparts knowledge usually one-way, namely from the teacher to the student. In this environment, discussions are held, primarily to assess whether students have gained the knowledge that has been imparted. This type of course arrangement most closely parallels the traditional lecture environment where the teacher transmits information to students.

In our courses we teach instructors to be constructivist in their approach to teaching and learning online. They are taught to facilitate a discussion where the learning and teaching comes from the discussion, itself. Hence, multiple interactions occur: student to student, student to teacher and teacher to student. Learning and knowledge being imparted can come from any one of those interactions. For a teacher to teach in an online environment, this role adjustment from instructor to facilitator must be considered. This also has many implications on the nature of the online teaching environment.

One implication of being a facilitator in online learning environment is that it changes the power differentials that would normally exist between an instructor and a student. In an online environment., the weight of each student's voice is given more value than a traditional classroom environment where the student may not necessarily give each student the opportunity to contribute to a discussion. The online environment begins to equalize the power differentials that may exist between students and the facilitators, giving everyone equal access to the discussion. Hence, taking on the role of a facilitator on an online environment can mean more discussion and more learning opportunities.

The second implication of taking on the role of a facilitator has on an online environment is that the learning environment becomes driven by discussion and the interaction between the contributors of that discussion. In a traditional classroom, it may have a limited two-way interaction and thus a reduced discussion. In contrast, an on-online interaction may be more equal in that two-way and multiple interactions are expected and allowed. This expectations and allowance of a full discussion sets the online stage for learning. Learning for the students comes from the discussion, itself, and their participation. The discussion can generate and foster ideas. This generating and fostering of ideas can give all student's in the discussion a chance to gain insight and thus learn.

The nature of the online teaching and learning environment becomes more discussion oriented as opposed to one of traditional teaching where the interaction is usually one-way. The implications that this has for the facilitator is that the facilitator's primary role is to create an environment where meaningful and insightful discussion is generated. How does a facilitator achieve this on an online environment? A facilitator can achieve this through a two-stage process: a) establishing commonalities and, b) driving the discussion through challenges.

Summary

In order to promote effective online learning instructors need to have specific training in facilitating and organizing interaction. It is useful for them to recognize the nature of discourse and to provide reassurance to the neophyte and experienced online learner.

The body of the paper provides practical suggestions for developing a program that keeps instructors and students engaged actively in the online environment.

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Biographical Sketch

Dr. Sharon Rich is the Chair of Continuing Teacher Education at the Faculty of Education, University of Western Ontario. She has led the development and implementation of UWO's robust teacher professional learning through distance education program.

Address: 1137 Western Road
London, ON
Canada, N6G 1G7
E-mail: srich@uwo.ca
Phone: (519) 661-2111

Native American and Cultural Issues in Multimedia Learning

Randy Ross, Tribal Affairs Coordinator
American Distance Education Consortium
Lincoln, Nebraska

Dr. James May, Technology Consultant
National Museum for the American Indian
Smithsonian Institution
Washington, DC

Dr. Kevin Gamble
North Carolina State University

Session will focus on Native American culture and the future of Indian Education in relationship to advanced multimedia technology and education. Also, an overview will be provided on broadband wireless technology delivered via satellite to rural remote areas.

Learning styles and other cultural factors should be considered when working with specific tribal cultures and culturally different populations. Native Americans have a rich cultural history and the learning styles as well as approaches to learning require a unique set of cultural sensitivities; this may involve factors of traditional language, thought, and philosophy. Multimedia tools are being used for language preservation and revitalization; teaching/learning in traditional learning environments. The cultural impact of new technologies will impact tribal communities in a double edge sword effect; and, the ability to empower tribal elders and teachers with culturally appropriate use of new technologies is critical to the future of tribal society.

Cultural experience and the recognition of cultural diversity are key to balanced learning in today's population culture society and growing information economy. Portals of cultural based learning are now well under construction by Native American educators; tribal communities, Indian museums, and tribal cultural leadership; however, it is still at a very preliminary level. Multimedia communications and cultural diversity, and the relationship to learning and values is to be explored in the presentation and discussed by participants. Rural remote locations, with new broadband wireless technology rapidly being deployed, offer new opportunities to reach isolated areas of the country, to include Indian reservations around the United States. Tribal Colleges and Universities, tribal community organizations, and schools have now the opportunity to explore and experience greater applications linked to web-based learning but also, more importantly, to become producers, presenters, and evaluators of instructional content, delivery strategies, and methods use when bringing digital tools to the education arena.

Biographical Sketches

Dr. Jim May brings a new view to community education and outreach to the National Museum of the American Indian. Through the 4th Museum, the NMAI intends to engage tribal communities and communities across the Americas in sharing the vast rich resources of the museum facilities established by NMAI in New York City; Maryland, and Washington, DC. The main museum facility is now under construction and is placed next to the National Capitol and the National Air and Space Museum. The NMAI has launched major programs to connect with schools, tribal colleges, educational audiences from all levels, and is increasing linkages with international interests. Dr. May served among the founding faculty at Cal State University Monterey Bay; Ft. Ord base conversion project to establish the newest and most technological advanced learning institution among the California University system.

Address: National Museum for the American Indian
Smithsonian Institution
Washington DC (Cherokee)
URL: http://indian.monterey.edu/may

Randy Ross serves as the Tribal Outreach Coordinator for the American Distance Education Consortium (ADEC).Ross has worked for several years in the area of community networks specifically with tribal communities and non-profits.

The satellite extension project brings to the forefront wireless technology, hybrid networks, and educational effectiveness shall be discussed in relationship to tribal outreach activities currently underway.

Address: American Distance Education Consortium
Lincoln, Nebraska
URL: www.adec.edu

Dr. Kevin Gamble serves as the technology director for ADEC and overseas the network deployment and coordination with Tachyon, San Diego Super Computing Center, and the ADEC engineering workgroup.

Address: North Carolina State University

Information About Distance Education:
Finding What You Need, Quickly and Painlessly!

Farhad Saba, Ph. D.
Co-founder Distance-Educator.com

Vanessa Haakenson, M.A.
Co-founder Distance-Educator.com

Information Explosion in Higher Education

There is an explosion of information in higher education. Lyman and Varian, respectively, Associate Dean, and Dean of the School of Information Science at the University of California, Berkeley estimated that "the world produces between 1 and 2 exabytes of unique information per year, or roughly 250 megabytes for every man, woman and child on earth. This is equivalent to the textual content of 250 books." In a form that we all can understand: 1 exabyte = 2^60 =1,152,921,504,606,846,976 bytes!

In 1991, the Association of Research Libraries estimated that there were 118,500 periodicals being published, 70,000 of which had been founded since 1971. (Chodorow 1998).

Obviously, not all of the information created in the world relates to distance education, but increasingly periodicals in almost all fields are publishing new information about our area of interest –distance education. Practitioner-oriented journals and magazines cover distance education topics from various perspectives. From nursing continuing education journals, to journals directed to attorneys, and accountants carry articles about our field.

Let me give you an example. Some of you undoubtedly are subscribed to Educational Telematics, which is an international listserv concerned about distance education among other topics. A few weeks ago, one participant asked about studies which would indicate the efficacy of online education as compared to f2f instruction –a topic near and dear to the heart of many in education! To my amazement, the first respondent to this request made a reference to Modern Maturity magazine, which is published by AARP (formerly known as the American Association of Retired People). When I responded by indicating that Modern Maturity is hardly an authoritative publication in the field of distance education, a message came back on the listserv, that that might be true, but the article was full of good information, including comparative analysis of f2f VS online learning, specially for the population it was addressing. This dramatic increase in sources and types of information available has made it very difficult to pinpoint the specific information you need in order to manage your programs.

Size of Distance Education Today

The growth of information about the field has been in parallel to the growth of the field itself. In recent years, our field has grown dramatically. However, statistics about the growth rates should be looked at carefully to understand the magnitude of its phenomenal expansion. Let me present one case to illustrate this point. In California Community Colleges, between academic years 1996-97 to 1997-98 while the growth in the number of courses offered at a distance has been 3 percent, students in these courses have accounted for 17% of the total growth in student enrollments in the community college system statewide. (Michel, 1999).

National Center for Education Statistics reported that in the academic year 1997—'98, about one- third of 2- and 4-year postsecondary institutions in the U.S. offered courses at a distance, and one-fifth of institutions planned to start distant education operations within the next three years. The number of courses available on the net or other distribution systems increased from an estimated 25,730 in 1994-'95 to 54,470 in 1997- '98.

Enrollments in 1997-'98 were estimated at 1,661,100, more than twice the number enrolled in 1994- '95. In the last three years the number of programs and courses has steadily increased. Consequently, according to NCES all but nine percent of public 2- and 4-year institutions either offered or planned to offer distance education courses in the next three years. 82 percent of public 2-year and 86 percent of public 4-year institutions plan to start or increase their offerings to other branches of their institutions or other college campuses, compared with 61 percent of private 4-year institutions.

Growing Distance Education Resources

Accurately guessing the size of distance education literature is not an easy task, but one thing that could be said with certainty is that it is rapidly growing.

- There are an increasing number of online scholarly publications dealing with distance education. Just to give two examples, since last year when we presented in this session, Athabasca University has started publishing the International Review of Research in Distance and Open Learning, and Anadolu University is now publishing the Turkish Online Journal of Distance Education. Given the crisis of paper-based publications, we think that this trend is going to continue and accelerate.

- Many newspapers throughout the country are covering distance education primarily by interviewing students and faculty who are involved in the practice. Five years ago you could hardly find any stories about distance education in a local newspaper. Today, hardly a day goes by without several stories appearing in newspapers throughout the country.

- National newspapers, such as the Washington Post, the New York Times, The Wall Street Journal and the Christian Science Monitor have been covering our field extensively.

- The number of books that are published about the field or on subjects related to distance education is still small but they are increasing at a rapid rate too.

- There has been an avalanche of news items, and press releases from corporations in the private sector which provide a variety of online services from authoring courses to telecommunications and database management to institutions of higher education. Despite the demise of the dot-com companies, those involved in distance education or as they call it eLearning are very healthy and are doing well.

- Government agencies, and governing bodies ranging from the National Governors Association to the Federal Communication Commission, and the Supreme Court of The United States also are engaged in policy making, legal proceedings and allocation of funds on a number of issues ranging from copyright and intellectual property laws to financial support for distance education in universities and colleges, to allocation of bandwidth and myriad other issues. They also are creating information related to our field at an astonishing rate.

Categorizing the Information

In searching for news and information about distance education, we have found nine categories of information, which provide a good overall view of the literature base in the field. These are:

- Higher education news sources, including university and college press releases, and college student newspapers
- Company press releases
- Policy reports, committee reports, legislative reports, and other government sources
- Expository description of ongoing programs and projects
- Data based description of programs and projects
- Theoretical literature of the field
- Data based, theory-driven literature
- Data based atheoretical literature, and
- Online databases, and websites such as UW-Madison's Distance Education Clearinghouse, distance-educator.com, ERIC, etc.

How to Gain Access to This Information and Stay Informed

To keep track of these sources and keep our subscribers and readers informed about the most recent developments in the US and around the world Distance-Educaotr.com monitors more than 800 sources of information on a regular basis. These sources include:

- Daily Press Releases and Email News
- Daily Email News issued by newspapers and various other publications
- Search Engines with news operations such as Yahoo!, Excite, and Northern Light
- Scholarly Publications
- Magazines
- US Department of Education sources such as ERIC and the National Center for Education Statistics (NCES)
- Newsletters covering the field and
- Information Portals such as UW-Madison, which maintains Distance Education Clearinghouse.

Distance-Educator.com News and Its Information Products

Now my colleague will describe how we present this information to you in various products ranging from the:

- Distance-Educator.com portal, to the
- Daily News Digest, and the quarterly
- Policy Briefs.

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Biographical Sketches

Farhad Saba has been practicing in the field of distance education in the past 30 years. He is professor of Educational technology at San Diego State University. A recipient of the Charles A. Wedemeyer Award and a frequent contributor of theory-driven, and data-based research articles to scholarly journals, he is also co-founder of Distance-Educator.com. Dr. Saba's current consulting projects include establishing a new private international school for distance teaching and learning, assisting the College of Extended Studies at San Diego State University to expand its operations, and developing a training program for local site managers of distance learning for the International Technology and Training Corporation.

Address: Distance-Edicator.com, Inc.
E-mail: vanessa@Distance-Educactor.com
URL: http://www.distance-educator.com
Phone: (619) 461-0370
Fax: (619) 461-0625

Vanessa Haakenson is the co-founder and Chief Operating Officer of Distance-Educator.com, Vanessa brings several years of experience in developing web based instructional products and provides creative direction for our products and clients' projects, guiding them from concept to completion. After earning her Master's degree in Educational Technology at San Diego State University, Vanessa founded Vworld New Media, which later became iThinkMedia Designs, in order to continue the work she was doing in developing CD and web-based interactive projects. Vanessa has authored several articles on effective information design and has taught college courses in interactive theory and new media design.

Address: Distance-Edicator.com, Inc.
E-mail: saba@Distance-Educactor.com
URL: http://www.distance-educator.com
Phone: (619) 461-0370
Fax: (619) 461-0625

Designing Course Evaluations for Interactivity in Distance Learning

Debra Sarlin
Instructional Designer/Researcher
RPI/SUNY Albany

Kim Scalzo
Director, Professional and Distance Education Programs
Rensselaer Polytechnic Institute

"Evaluations are a *real world* activity. In the end, what counts is the extent to which evaluation leads to modified policies, programs and practices—ones that, in the short or long term, improve the human condition." (Rossi & Freeman, 1985, p.357)

Using distributed models and multiple media to deliver educational content, support interaction, and foster engagement at a distance may demand new strategies for course evaluation. Through Professional and Distance Education at Rensselaer Polytechnic Institute (PDE/RPI), faculty and staff design, deliver and support courses for campus classrooms, satellite distribution, video streaming, video conferencing, videotape delivery and web-based environments. We consider that the electronic environments we are all designing and entering are as socially complex as the physical structures that contain our face-to-face interactions (Feenberg, 1989). Yet, it's interesting to note that the predominant illustration for understanding the educational process does not include social dynamics in the model.

Interaction and Learning

Romiszowski (1981) reminds us that Bloom's seminal work divides elements of learning into three domains. This model, comprised of cognitive - intellectual knowledge and skills; affective - individual feelings, attitudes and values; and psychomotor - physical skills (Bloom et al., 1956), describes the breakdown of a dominant, perhaps over-arching representation of learning. This three-part model scripts out the social domain: leaving interaction under-recognized and under-examined.

Within the wide world of educational research, many attempts have been made to recognize and re-examine this limitation. Moore (1989) suggests, that in spite of differences in media use, we might agree to distinguish (and measure) interaction as being between: Learner and content; Learner and instructor; Learner and learner. Building on this effort to tease out strands of interaction, Hillman, Willis and Gunawardena (1994) propose a forth elements of interaction between: Learner and interface (measuring the effects of technical devices). In formulating a wider understanding of Social Presence and interaction in the SUNY Learning Network, Fredericksen, Pickett, Shea, Petz, and Swan (2000), suggest that in order for students to experience high levels of interaction and to perceive that their own levels of learning are high in on-line courses, high levels of faculty-content interaction and faculty-technology interaction must precede the interactive learning process.

Based on this research, we might propose that a fuller model of interaction in educational systems must account for all of the following relationships:

I. Instructor and learners
II. Instructor and interface/technology/support
III. Instructor and content
IV. Learner and learners
V. Learner and interface/technology/support
VI. Learner and content

Interaction and Instruments

Six elements of interaction combine to form complex perceptions of interactivity within on-line courses. A wider understanding of the interactions within electronic social environments must be reflected generally as well as in course evaluative processes. If an interactive message is one that further builds on prior message strands (Rafelli & Sudweeks, 1998), then interactivity in educational environments can be measured in the successful or unsuccessful building relationships described in the types of interactions listed above.

In moving towards RPInteractive as a model for online course delivery, PDE has developed new instruments and strategies to gather information from students and faculty focusing on these six levels of interaction in interactivity. Our primary objective in examining interactivity and in building a distributed model is to further foster highly personalized and valued exchanges that support learning.

To strengthen the reporting for each evaluation cycle we have created an online faculty form to match our student midterm or "formative" course evaluation. Questions in the student midterm evaluation and the faculty form address each of the six interactive relationships. Our end of semester form, *Kansas State's IDEA* form is currently available in paper-based format. We anticipate testing the IDEA Online Student Ratings of Instruction system during 2001-2002. Additionally, to supplement our end of semester data we have developed a set of questions for virtual FOCUS FORUMS.

Return rates for evaluations are historically low in our community. In order to clearly untangle strands of interactivity online, we need to increase our report rates. Attempting to align methods of evaluation delivery with course delivery, to increase returns, and to further foster reflection, we have moved our student mid-semester instrument (a primarily scale based evaluation), from paper format to an online version. Data representing returned evaluations from ten PDE/RPI courses is examined in figures one and two and in table one below. The ten courses selected for inclusion in the dataset were each taught by the same professor in both the spring semesters of 2000 and 2001.

Figure 1:

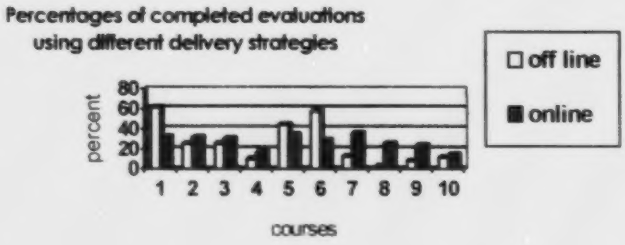
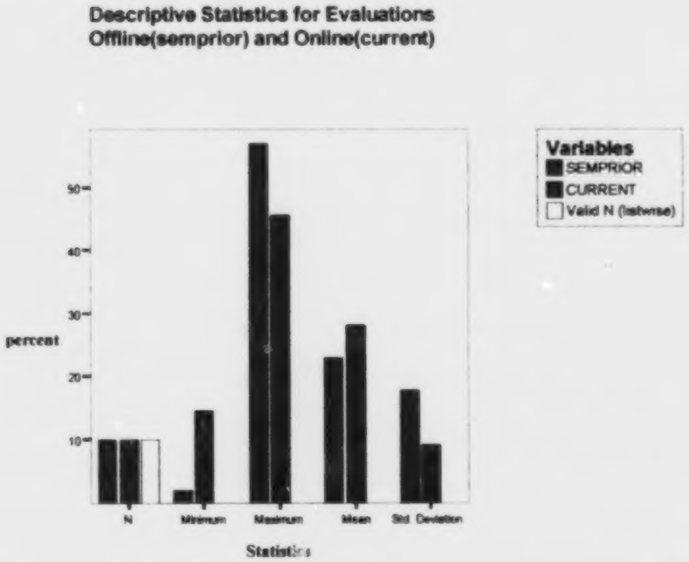


Table 1:

Descriptive Statistics for Evaluations Offline and Online

	N	Minimum	Maximum	Mean	Std. Deviation
Offline, SEMPRIOR	10	2.00	57.00	22.9000	17.7917
Online, CURRENT	10	14.58	45.61	28.1997	9.1853
Valid N (listwise)	10				

Figure 2:



While the rise in returned online evaluations in distributed courses is not statistically significant in this small sub-set, we can see small but measurable mean differences when the method of evaluation delivery is aligned with the method of course delivery. We are anticipating that the return rates will further increase as Faculty members become more familiar with the process of leading students to the online evaluation form through a linked course-based URL.

To gage or evaluate interactivity in online distributed courses, we are gathering both quantitative and qualitative data. Our FOCUS FORUM (Table 2) was in part designed based on Mathison's proposal that participatory evaluation depends on deliberative processes (Mathison, 1996). Suggestions set out by Monolescu and Schifter (2000) to merge virtual focus groups and the Delphi technique, were linked to strategies for engagement measurement supported by Solomon, Globerson, and Guterman (1989). Our instrument for gathering qualitative, deliberative, online feedback is displayed in Table 2.

An invitation to participate in the Focus Forum is issued electronically to students. Directions explain that Focus participation is different from regular online class postings in that messages can be anonymous, and have distinct components:

- On **day one** students are asked to read the question and post feedback.
- On **day two** students are asked to read what their classmates have posted to the **first day's** question and to respond either in the form of a summation of total posts or as a response to a specific message. *Then* students as asked to read the **day two** question and post feedback.
- The **Focus Forum** continues this cycle of feedback and response for seven days.

Using this combination of measures, we will be broadening our examination of interactivity in PDE/RPI distributed courses. We will continue to ask large, and sometimes seemingly looming questions concerning technology, message building and engagement within diverse educational delivery structures. We look forward to exploring other models being developed by researchers and designers grappling with these issues.

Table 2:

Focus Forum group questions for online feedback

Day 1 **The most important "area" for learning in** 'Your Course' **was the:** Asynchronous discussion Homework problems On-line modules Synchronous audio sessions Textbook VideoStream Other… **WHY?**	**Day 2** **The most helpful "area" for concept building was the:** Asynchronous discussion Homework problems On-line modules Synchronous audio sessions Textbook VideoStream Other… **WHY?**
Day 3 **The most important "area" for interactivity was the:** Asynchronous discussion Homework problems On-line modules Synchronous audio sessions Textbook VideoStream Other… **WHY?**	**Day 4** **If low engagement is…** tying your shoe, **And if high engagement is…** solving the most complex math problem you've ever encountered, **How would you rate your own engagement in** 'Your Course' **as a whole…?** **and… In each area:** Asynchronous discussion Final Project Homework problems On-line modules Synchronous audio sessions Textbook VideoStream
Day 5 Is it possible to form an idea about **who each class member IS** in distance education classrooms… **If so,** how does this happen?	**Day 6** Is it possible for **the professor** to form a clear impression of **You,** And also possible for **You** to form a clear impression of **the professor** in distance education classrooms… **If so,** how does this happen?
Day 7 **In distance classrooms the most important interaction is with:** Content Expectations Other students Professor Technology Time **WHY?**	**Day 8** Thanks and summary posting from the Instructional Designer.

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Biographical Sketches

Debra Sarlin is an Instructional Designer for Professional and Distance Education (PDE) Programs at Rensselaer Polytechnic Institute, an Associate Researcher of Technology at The National Research Center on English Learning & Achievement, and a Doctoral Student in Instructional Technology at the State University of New York at Albany.

Address: RPI, 110 8th Street, CII 4011
Troy, NY 12180
E-mail: sarlid2@rpi.edu
Phone: (518) 276-2988

Kim Scalzo is the Director of Professional and Distance Education (PDE) Programs at Rensselaer Polytechnic Institute and has responsibility for the delivery and support of its distance education program, RSVP, which provides courses, certificates and degree programs to over 1000 working professionals at over 60 corporate locations as well as individual students all over the world.

Address: RPI, 110 8th Street, CII 4015
Troy, NY, 12180
E-mail: scalzk@rpi.edu
Phone: (518) 276-7787

Interactive Online Learning for Teachers: Life Is Full of Possibilities!

Dr. Elizabeth S. Saunders
Coordinator, Master Teaching and Leadership
University of Illinois at Springfield

Meeting Real Needs

Teachers want to earn a master's degree for many reasons: to increase their effectiveness as teachers, to advance on the pay scales at their schools, or simply to continue learning. There are any number of reasons why they don't do more than just look into earning a degree, though, most of which have to do with busy professional and personal schedules. After teaching all day, they don't want to have to drive anywhere from 30 minutes to an hour-plus in all types of weather to sit in a class. Then they may not participate because they are tired or have problems {and grading!} waiting for them at home, after they finish the drive home. Often there are children who also need to be taken from one activity to another, and spouses who may want to just sit and chat for a moment. They need courses that fit their busy schedules.

Also, they want to learn more than just being a more effective classroom teacher. They are often on school, district, or state committees -- new roles for many classroom teachers! They want to learn how to work in groups, how to assume leadership roles without giving up their classroom expertise, and how to use the types of organization/management tools others are using. They want to be involved in their futures as professionals and community members. Unfortunately, most education master's degrees are in technology, curriculum and development, a specific subject matter, or, those with leadership courses are geared for future principals. There simply hasn't been a degree that is for teachers who live real lives and who want to earn a high quality master's degree that relates to what they want to do – improve their teaching and learn about being a leader, but not an administrator, in their schools.

At least there hasn't been until now.

The Master Teaching and Leadership (MTL) concentration of the Educational Leadership master's degree at the University of Illinois at Springfield was conceived, designed, and is operating specifically for the teachers described above. It is a totally online degree where teachers and other people involved in education take what they are doing, or what they would like to do, learn how to improve on that, and try the new way. This happens with the support of other teachers as well as their online instructors. They are on a path of continuous improvement in both teaching skills and leadership abilities. And, within the structure of the university semester schedule, they are doing it at their own time. They are online at noon and at midnight. They are online for fifteen minutes while they fix supper or wait for a student's appointment. They read, respond to questions, discuss and debate, complete projects that relate to their own classrooms, work in teams, create web pages, map curriculum, learn how to construct and e-mail flow charts and Plan-Do-Study-Act diagrams. And they have fun learning because it is real and because they have support from a 'virtual' learning community that includes teachers from all types and sizes of schools around Illinois, around the country, and around the world.

Teaching and Leadership for Teachers, Not Administrators

MTL deals with real-life teaching issues. It is a degree for classroom teaching and leadership in a school or community situation. Some of the issues, for example, deal with standards and the value of standardized assessment to achieve the goals of school improvement and educational reform. Questions are researched and debated on school reform, such as who should benefit and who really does benefit. Concerns about their students are discussed, such as those students who are difficult to reach, and the and debated on school reform, such as who should benefit and who really does benefit. Concerns about their students are discussed, such as those students who are difficult to reach, and the parents who challenge everything the teacher says and does. Curriculum models, topics for research, and district technology plans are debated. However, these topics can be covered in any traditional teaching course. What sets MTL courses apart is that because they are online, perspectives on the issues are received from so many different types of teachers: from the new teacher to the one with 20 years experience; teachers from large urban schools with a turnover rate of 55+% and teachers from stable rural schools where the teacher had taught the student's parents; teachers from districts with significant resources and teachers from districts where current textbooks aren't always available.

One of the points stressed in the each of the courses is that all of the activities are based on what is happening in each teacher's classroom. This makes teaching the courses more difficult, but also makes the information gained by each teacher that much more valuable. For example, when the teachers map curriculum at the beginning of the Instructional Design course, they each map their own and then work with that throughout the semester. That sounds logical until you realize that the instructor has to then work with twenty individual curriculum improvement projects that must be followed from beginning to end online. However, since the purpose of the degree is to expand the teachers' thinking about teaching methods and their perspectives on educational issues, this personalization extremely valuable.

Being Totally Online

Having the entire program online has been an interesting and mostly fun challenge. When teachers who want to join MTL are interviewed in the admission process, they are asked the question, "How do you feel about never meeting face-to-face?" A few have either taken online courses before or work online often enough that it doesn't matter, but the great majority are quite concerned, and they remain that way for the first few weeks. While Black Board is not difficult to master, the combination of learning how to navigate through it, working with teachers who you don't see and therefore cannot get body language communication, and attempting to do the actual coursework can be intimidating. Our technical department, the Office of Technology Enhanced Learning, has developed an orientation to Black Board that helps teachers get going, but we also are striving to develop a true 'virtual' learning community so that current teachers can help the new teachers just joining the program.

We are accomplishing this in various ways. The first item of business in all of the courses is introductions, which are partly the traditional 'who are you and what do you do?' and partly something that looks at the person beyond that scope. For example, I have friends in Montana, and so was watching the forest fires during the summer of 2000. When we started the fall semester that August, I asked the students what they would take with them in a pick-up truck if a forest fire was coming and they had only ½ hour to pack, and could only make one trip. The answers were interesting, gave people a chance to get into Black Board with something they were comfortable talking about, and most importantly, let us know a lot more about each other.

An activity we initiated this past summer was a mentoring program. I put teachers into mentor-mentee pairs, without concern about their location, what they teach, or what courses they were taking. My primary concern was the personalities that I had seen in the current teachers and what I knew of the new teachers. I asked the mentors to contact the mentees just before the first week, and to keep in contact with them. Now, if the mentees come to me with a problem I think mentors can resolve, I forward it to the proper mentor and let the mentees know that I have done so. I want to be sure they are comfortable coming to me or to their instructors, but there is a lot that can be done by the mentors, and most of those things help build the sense of community. For example, one of the teachers in my summer course mentioned during the weekly Office

Hour chat that she was having difficulty with the reading; she received three offers of help immediately. We also strongly encourage individual conversations, and generally have a Discussion Board forum where everyone can list their Instant Messenger addresses. Some of the teachers in the spring semester who taught in different schools but were teaching the same grade level "talked" to each other using AOL IM almost every day!

Recruiting and Admitting

The entire process of learning online begins with the recruitment and admission of teachers and others in education to MTL. In the past we recruited using many of the same tools as everyone else. We use brochures sent to schools, radio ads, presentations, using the University of Illinois Outreach program, and online. Most of our teachers join MTL by finding us on the Internet. Once the teachers express an interest, I respond, and if they seem interested, I ask them to complete an application form, which can be done totally online. After they do that, they are put into my system, and I call them and conduct a very brief interview. So many of the teachers ask when they have to come to Springfield for the interview, and when I tell them it is done over the phone, they are quite amazed. Yet you can learn a significant amount about a person by asking six or seven questions and listening to their answers carefully. I have reached a point where I can almost tell when people will or will not stay with a course or with the program just by listening to what they say or don't say during the interview. The teachers also have to be admitted to the university, which is another check on their abilities, although I don't worry too much about grade point averages of teachers who graduated ten or more years ago. Most of the time I will give teachers one semester on a provisional status so they can decide if this is for them and if they can do it well. Our rate of attrition in using this process has been not more than one or two percent, and most of the people who dropped courses were only interested in taking one or two courses for certificate renewal.

One point that is particularly important is that teachers are asked to 'join' MTL. It is treated as a learning community from the very beginning. Also, in the interview, rather than ask about strengths or abilities, I ask about what the teacher would bring to the learning community.

Instructional Techniques – Teaching Teachers

It is always interesting to teach teachers because you have to take their learning and teaching methods into consideration. We use written lectures, sometimes with PowerPoint slides and other times with just text, which are generally no more than a few pages; we are just now beginning to use audio streaming. Each course also has at least one text, and many have two. We use the Discussion Board, complete group and individual projects, and have online quizzes. At least one course has a proctored final exam. The teachers are also learning tools for continuous improvement such as developing flow charts, creating a matrix of information, and using Plan-Do-Study-Act diagrams all online, which has turned into an out of the ordinary project. What the teachers see and do online is very similar to what teachers would see if they were getting their master's degrees in a classroom, except that they are sitting in front of their computers. Some of the instructors use group projects quite a bit, and the teachers seem to like that. Other instructors, in courses where group work may not be as important, such as the Educational Research Methods course, do not. We have begun using 'paired' groups of the instructor and a student, a feature of Black Board that we are finding quite valuable. The Illinois State Board of Education is requiring all non-degree seeking programs to maintain student records for approximately three years; while we do not have to meet that criteria because as a university they know that we, as a university program, have to meet recognized stringent rules and standards, we are keeping everything possible in Black Board at the moment so we can easily meet or exceed the criteria.

As part of the teaching, some of the instructors use an hour once a week to be online with their classes. In my Office Hour on Wednesday evenings, I try to ask about the assignments, and I take questions on the assignments or anything else on their minds. This is also, however, a great time for bonding and community forming. We also use the chat time to have conversations with guest speakers who have submitted lectures earlier in the week.

Meeting the Standards

MTL was conceived within the concept of the National Board for Professional Teaching Standards (NBPTS), the Malcolm Baldrige National Quality Award (MBNQA) criteria of excellence in education, and, of course the National Council for Accreditation of Teacher Education (NCATE) and the Illinois State Board of Education (ISBE). While meeting all of those criteria is a challenge, and while I cannot state unequivocally that we are there, that is our goal. We began by developing the degree around the NBPTS criteria, which is why we decided on Master Teaching, and also around the Leadership attributes promoted in the MBNQA. The Educational Leadership program is working on its NCATE accreditation, so it seemed only logical that MTL would follow those criteria, also. Finally, as noted previously, the ISBE has developed a set of criteria for providers of online courses to ensure that they meet the high quality standards required for certificate renewal, and while university degree-seeking courses are exempted from these criteria, we felt strongly that we should at least meet, if not exceed them.

Two final points of using the criteria for excellence in education should be noted. First, MTL will undertake a self-assessment using the MBNQA process, and second, based on those findings, will conduct a benchmarking study in the spring to ensure that we will continuously improve.

Meeting the Needs = Flexibility and Growth

Professional development for teachers is a continually changing process, and to meet those changes, MTL is changing also. We've captured a part of the graduate teacher education market, but we know we will need to look ahead to maintain our strength.

Some of the opportunities we are looking at are, of course, adding courses. We have added courses to meet the increasing numbers of teachers who are interested in earning the degree, or even simply taking courses for certificate renewal. We will be adding a course on law for teachers that will address all the issues teachers face – whether or not they realize it – as they educate their classes. We are also looking at some way we can help teachers interested in earning the Master Teaching Certification.

We are also looking at the possibility of changing the format and process of the degree somewhat. At this point, all of the courses offered are required, but we are considering, to better meet the needs of the teachers in the program and those in the future, to having only four or five of the ten courses necessary to earn the degree as core required courses and the rest would be a choice of electives. Of course that causes other issues to have to be addressed, such as who will teach the courses, but with continued enrollment increases, these issues are starting to be addressed.

Closing: Meeting Real Needs

The entire MTL focus is on meeting the customer's need. We feel our principal customers are teachers who have a strong desire to improve their teaching and leadership skills, all the while teaching, and living in the real world.

Through the innovative use of technology, the commitment and support of the UIS leadership, we feel we re making a significant positive difference in the lives of our teachers' students.

Biographical Sketch

Dr. Elizabeth (Lisa) Saunders is the Coordinator of the Master Teaching and Leadership concentration of the Educational Leadership master's degree. She started her schooling at the University of Missouri, Columbia, received her B.A. from Bradley University, Pecria, IL, her masters in curriculum and instruction from Michigan State University, and her Ed.D. from Illinois State University. She has had managerial positions within and outside education, and has served as an examiner for the Lincoln Foundation for Business Excellence. She also taught seventh and eighth grade language arts and social studies for six years, and was department chairperson for two.

Address: Educational Leadership, BRK 393
College of Education and Human Services
P.O. Box 19243
Springfield, IL 62794-9243
E-mail: saunders.elizabeth@uis.edu
Phone: (217)206-7562 or (309)822-0041

Learning Objects Phase Two:
Integration Into Performance Support Portals

Steven Schatz, Principal
Steven Schatz Information Design
Graduate Research Assistant, Indiana University

Over the past two years, many involved in instruction have been exposed to the idea of web based pieces of instruction which may be retrieved by means of meta tags. Whether called reusable learning objects, knowledge bits or any of a host of other names, the chimera of instruction created on the fly of pieces from all over the world has captured our imagination. As this undertaking moves from fantasy to reality, serious questions have been raised. In this paper, we consider three concerns and examine using objects in support of performance (instead of training) located in a web portal with additional functionalities.

Where Are We Now?

A year ago, the focus of most people working on learning objects was mostly technical. What tags were needed? Could Learning Management Systems be made to open compliant objects? Could agreement be reached between software companies, training providers, educational institutions, government representatives and other key players on meta tag standards? In August, 1999 the IMS released its first meta data specification. Last summer, ADLNet released its SCORM (shareable content objects reference model) 1.0 specification. Interoperability of learning objects was finally possible.

The next challenge was to begin to build and use meta tagged learning objects. As the process of developing learning objects and using objects in the instructional design process began to move forward, concerns about learning objects arose. These included granularity, customization and control.

Concerns

Granularity

How small should an object be? There is no clear answer. Currently, many objects are quite large. Many objects are actually online courses divided into units. Each unit is a learning object. One hungers for the ability to search and retrieve smaller pieces – perhaps pictures and sections of text. However, the smaller the granularity, the greater the cost of tagging. Tagging a unit is a small cost, but tagging each picture and paragraph may cost more than producing the training. A balance must be struck between the extra precision gained from smaller granules and the extra cost for tagging more granules.

Customized Tagging Schemas

Closely linked to questions about granularity are questions about schemas. The organizations which are promoting schemas (ADLNet and IMS) have settled on a rather limited set of tags. As theses are organizations of entities wishing to produce and/or use objects, it is to their benefit to promote a universal, one size fits all approach to tagging. However, by creating unique schemas for use within an organization, one may gain much greater power over search and retrieval of learning objects.

While more tags provide more freedom, they also require more work. In addition, standards are important. If one plans to trade objects, superfluous tags would create confusion, so would have to be stripped out. Objects coming in would have to add the organizational tags. While one gains the freedom

Objects coming in would have to add the organizational tags. While one gains the freedom of extra tags, one loses instant interoperability. As with granularity, there is no clear answer, just a decision point to be reached within each organization.

Control

Who controls the search and retrieval of learning objects? Many instructional designers are very uncomfortable with the notion of learners controlling their own learning. They bring years of training and experience to decide scope and sequence of learning events. In many cases, the learner does not know what they should learn. Learning objects, say this camp, should be available like film strips or textbooks, reviewed and picked by an expert, supporting the work of a designer.

Others view the power of combining instruction with the search and retrieval powers of the web as the ultimate empowerment for learners. They will ask for guidance when necessary. They are self directed learners and this is one more tool. Instructional designers, much like librarians, will become experts at aiding learners combine information from disparate sources including learning objects (through developing and deploying tagging), information resources, and other employees.

Performance Support Not Training

While originally conceived as a tool for web based instruction, we suggest using meta tagged knowledge objects for performance support. Locating this tool in the realm of performance support sidesteps many of the concerns with learning objects in training.

Performance support implies situated cognition. In the course of performance, a worker/learner needs to acquire a bit of knowledge for a specific purpose. The implication is a shorter time engaged with a more directed task. This approach encourages a finer granularity. Viewing possible searches provides guidance for creation of unique meta tagging schemas. Finally, the instructional designer can provide necessary guidance through trainings, while segueing into a role involving connecting and supporting more varied learning experiences. This move to performance suggests the following implications.

Use of Portals

Performance encompasses more than learned skills. In order to effectively support performance, a variety of functions in addition to learning objects is required. As learning objects are de facto web based, bringing the concept of web portals into play is a natural step. A portal is a web page that provides access to other web sites and web functions, including search and retrieval. The software, technical experience and necessary infrastructure are well in place for the construction and maintenance of a web portal.

New Terms

While a portal will offer more than training, the same power of customization via meta tags may be applied to information such as postage rates, inventory and the like to great effect. These objects are not learning objects, but **are** tagged. We propose the term **information object** for objects of this type. To refer to the larger category containing both learning objects and information objects, we use the term **performance object**.

Customization to Personalization

A function common in portals is customization (my Yahoo and the like). Performance support has unique needs for each person. Meta tags have usually been conceived of as created by an authority in order to customize what users see. While standard tags and company tags would certainly remain the purview of a "tagging authority," users could personalize access to their information, building a "library" of performance objects complete with "notes in the margins."

Communication – Help, Chat, BBS and Person to Person

Communications is an intrinsic power of the web. Isolation of users is an inherent weakness. Often, the best, fastest or only available support is person to person – through chats or direct connection. These powerful methods for engaging the learner in situ are not new technologies. However, they offer some of the greatest challenges for designers. Getting users to use these tools has been an elusive goal.

Open System – Knowledge Grows

Finally, in combination with all the implications above, a performance portal implies a dynamic system with active moderating. If the portal is used, new performance objects will be requested, discovered, acquired. Tagging schemas will be revised. Most important, the contents of communications can be reformatted and included as objects. We hesitate to call this knowledge management, conjuring notions of a warehouse of objectified knowledge. We prefer to think of these new objects, developed from the discussions where knowledge was created, as **knowledge leavings** (perhaps not as exciting as when the parade passed by, but of certain use in encouraging growth).

A Model of a Performance Portal

Working with a group at Crane Naval Weapons Station, we are developing a performance portal prototype for aircraft maintenance workers. We are undertaking extensive front end analysis to decide on functionalities and a unique tagging schema. We believe that the following functions offer a model from which others may work, making changes based on end user analysis.

Learning Center

Three areas are considered – search for learning objects (meta tag based), prescribed lessons (instructional designer directed) and library (storing personal favorites). Control is in the users' hands during search and in the library, but guidance is provided in the prescribed learning area. Personalization in the library is an important function as it supports commitment by the user, increasing the utility of the tool and, thus, increasing the likelihood of continued use.

Lookup Center

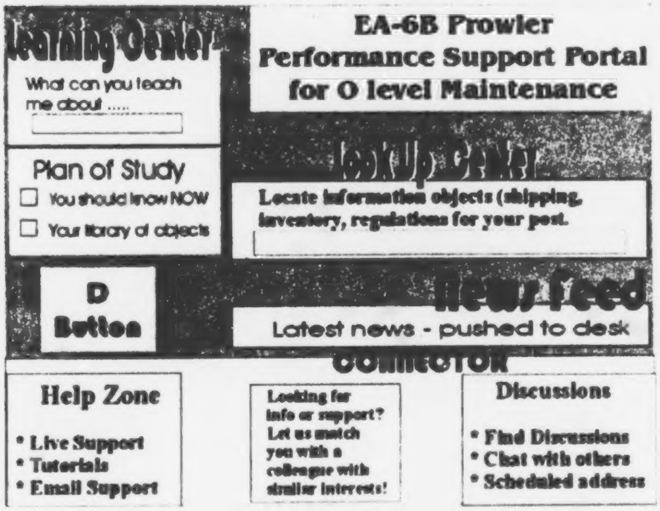
Search and retrieval of information objects that are meta tagged, but have no aspiration to teach. (For example, shipping rates displayed based on user's location and company shipping providers). Essential in an online performance support tool this information would often be dynamic, providing the latest information on items such as inventory and costs.

Support/Help

There are many roads to support in order to overcome user isolation. Timely help functions are essential to successful adoption because users have already turned to the portal because they have a problem. If they also have problems with the performance portal, then they have two problems. We started with a commitment to providing live or very timely support.

New Information Customized and Pushed

Again, taking advantage of a web technology, a push section will allow information tailored to the user providing the latest updates. Telephone call centers use this technology now to provide ongoing information of individual performance as well as alerts, promotions and incentives.


Learning Center
EA-6B Prowler Performance Support Portal for O level Maintenance
What can you teach me about .....
Plan of Study
☐ You should know NOW
☐ Your library of objects
LookUp Center
D Button
News Feed
Latest news - pushed to desk
Connector
Help Zone
• Live Support
• Tutorials
• Email Support
Discussions
• Find Discussions
• Chat with others
• Scheduled address

Locate information objects (shipping, inventory, regulations for your post.

Looking for info or support? Let us match you with a colleague with similar interests!

Figure 1. Beginning Prototype for Performance Support Portal

The Connector Zone

This area, as originally proposed, had four areas. Scheduled web conferences would allow presentations at set times. Synchronous chats encouraged communication between maintenance groups. Internet Paging (the D button) allowed quick questions to advanced technicians. Threaded discussions allow more detailed, thoughtful postings which can be accessed after the fact. Indeed, as users work out solutions through this medium, knowledge creation is reified and may be tagged for future search and retrieval. The matchmaker, supported connecting people who are working on similar problems.

Overarching Considerations

The use of meta tagged performance objects for both learning and support provide a powerful tool. Locating these performance objects in a portal with other functionalities which take advantage of the medium of the web while working to overcome the isolation of users holds great potential. As with any new enterprise, much experimentation is necessary. It is hoped that the proposed portal can provide a model for those beginning to seek useful applications for meta tagged objects. Some final considerations should remain with us as we develop and deploy these tools.

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Dynamic Tools

A portal is not like a ship—built and launched upon the seas. It is a dynamic, ever changing environment, more like a garden, which requires on going proactive interactions. As new objects are developed, they must be tagged and included. As new knowledge is explored (for example, a process detailed in a discussion), it must be reified and tagged. Discussions must be moderated and encouraged. New tags may be added. Old objects may be culled. The guiding principle in this work is to listen to the user. As the portal is used, users will discover new needs. The more proactive the portal is to the needs of users, the more the portal will be used. A positive cycle of improvement is possible.

Killer App

The killer app is the application which forces everyone to take the leap to the next level. For personal computers, the killer app was the spreadsheet. With Lotus 1,2,3… every businessman wanted a computer. For desktop publishing, it was postscript, which allowed laser printers to work. For the internet, it was email. Each of these applications had enough value to users to overcome the expense in time, money and frustration required. The value gained by the app was greater than the cost.

In making performance portals, one can very easily make something very cool that is not used. Look for a killer app – a function that will be so useful that it will get users to try the portal and keep them coming back again and again. The killer app does not need to be the center of the portal. It does not have to be flashy. The killer app provides an answer to a regularly occurring problem.

Users: First, During and Always

User centric design is essential if you want to find the killer app, the way to make a portal that overcomes the initial resistance to "another new thing," and the way to create active discussions Do needs, task and environmental analysis. During development, get feedback on designs. As the portal launches, seek out user feedback. Talk to users throughout the process. There is an enormous temptation to focus on the challenges of building when working with these new techniques. However, it is vital to look to the end user, to see how a portal can help them do what they are already doing—better, faster and easier.

Conclusions

The advances in the concepts of tagging and retrieving learning objects offer a great opportunity. However, the greatest promise may not be in training, but in performance support. Using concepts from human performance technology for guidance, a focus on the needs of the user takes on primary importance. The time is now ripe for the creation of performance support portals allowing personalized performance objects that offer learning and information via unique schemas while providing feedback mechanisms linking people throughout the organization so they may share and co-create knowledge, capturing the knowledge leavings for those who follow. A new world… a new view… we truly live in interesting times—be that boon or curse.

Biographical Sketch

Steven Schatz specializes in information design for electronic communications. He has worked with Xerox PARC developing educational applications, consulted with Fortune 500 companies on advanced electronic presentations, presented at national conferences including ASTD, Online Learning and Training 2000, provided ground breaking models for use of web conferencing, built computer and web based trainings for thousands of students and is developing a prototype performance support portal using meta tagged knowledge objects. Mr. Schatz was on the faculty of San Francisco State and is working on his Ph.D. at Indiana University's IST department.

Address: 1103 N. Woodburn
Bloomington, IN 47404
E-mail: schatz@powerstart.com
URL: www.powerstart.com
Phone: (812) 339-2102

Paradigm Shift:
Course Redesign That Empowers the Learner

Kathy J. Schmidt
Manager, Faculty Innovation Center
College of Engineering
The University of Texas at Austin

Brad Beecher
Field Engineer, Prometheus
The George Washington University

The claim that, "Universities have sometimes been described as institutions where amateurs educate students to become professionals" (Davidson & Ambrose 1994) can stir debate. Faculty members are the opposite of amateurs in their fields; however, they may lack formal training in pedagogy. Finding the time and or resources to learn more about teaching is often an arduous task for faculty.

Add to this mix a need for faculty members to learn how to use technology to enhance teaching and learning. During the last decade, the expanding range of educational technologies has created many choices for universities to deliver instruction. Courses that are taught online require redesign since simply porting an existing course to an online environment can lead to disappointing results. Far too often, university level courses rely on lectures and passive student behaviors. Yet emerging technologies can provide us with tools and environments that help us to move beyond teacher-centered, lecture-based instruction.

Course Redesign Issues

With so many options for enhancing instruction, how do faculty address pedagogical and instructional design issues? Many are turning to Web-based courseware for the design, delivery, and management of online resources and courses. These tools promote modularity, flexibility and scalability. However, many contend that a lack of overt integration of pedagogy in courseware tools exists and that "tools are driving the learning environment instead of the learning environment driving the selection and application of appropriate tools" (Wijekumar, 2001).

Successful online course preparation requires an understanding of the technology, the learner, and interactions between the two. Course design requires selecting technology that fits the course. Instructors need to analyze what the students will need to know in order to demonstrate understanding, what prerequisite skills the students must possess, as well as taking a look at learner characteristics and learning conditions. Course design involves reviewing the content to be delivered but also appropriate learner activities, support, and implementation strategies.

Course design steps, that is the conversion of classroom class to a distributed delivery involves these basic steps:

- Identifying course objectives – think about why you are teaching the content and then focus on student learning
- Align an existing content with objectives – you shouldn't need to alter objectives, but content (how it is delivered) may undergo change
- Plan for assessment – decide how to gauge student mastery of content and objectives
- Select instructional strategies – instructional sequences typically contain these elements:

Motivating the learner
Specifying what is to be learned
Prompting the learner to recall and apply previous knowledge
Providing new information
Offering guidance and feedback
Testing comprehension
Supplying enrichment or remediation (Dick and Reiser, 1989)

Compound the pedagogical issues with faculty who are adjusting to team course development. Course design and delivery in higher education is often a private act. Faculty have taught courses without input and review from fellow instructors or instructional designers. In order to successfully engage faculty in a team development process, provide the following:

- High touch – allow faculty to have one-on-one consulting and time as they deem it necessary,
- Baby steps – let faculty advance through the development process at their pace,
- Hands-on – provide opportunities for faculty to explore the tools in the courseware toolbox,
- Focused review – scrutinize course objectives and student activities.

Can course redesign be aided by the use of courseware tools? Can the use of courseware tools promote courses that empower the learner with complex perspectives, engagement in higher order thinking, and access to an active learning environment? Discussing the effectiveness of courseware has to involve discussing the larger issue of content and student tasks as well as looking at the features/tools available within a courseware environment.

Addressing Redesign Issues With Courseware

There is an array of Web-based courseware tools that aid in course development, management, delivery, and administration. It is not the purpose of this paper to review the various attributes of these tools, but instead will use a single tool, Prometheus, to look at the feasibility of crafting optimal learning environments. But first, a brief look at Prometheus.

Prometheus is an easy to use, enterprise learning management system designed to empower instructors to deliver a compelling online educational environment for their learners. Prometheus was designed and continues to be developed at The George Washington University (GW), in Washington, DC. In 1997 GW created an Instructional Technology Lab (ITL), with the sole purpose of providing faculty with the tools and help needed use technology in the classroom.

Prometheus has been actively used at GW since fall 1998 and over 85% of the student body actively uses it during a given semester. With its roots solidly planted in academia, being physically located on GW's campus, they work with partner schools to build features and tools into Prometheus that meet the direct needs of these schools. One such example of working with our partner schools is with the University of Texas at Houston Health Science Center, which has a group that specializes in Informatics. Their Informatics Department preformed heuristic evaluations of Prometheus, which provided an outside perspective to further refine the interface to make it ease for faculty and students to use Prometheus. Also with Prometheus licensed as an open source code application, it allows schools to further customize the application to meet specific course needs and enhance the learner experience. To facilitate communication between partner schools using Prometheus, an online community tool encourages schools to discuss development projects they are working on in the application and allows these schools to license or purchase features developed by other schools.

The Prometheus feature set includes the following tools to promote particular instructional activities:

- Prometheus Portal is designed to facilitate an online community atmosphere where users can interact with course-related materials and each other. Portal users can create affinity groups to interact with each other, pull in information from an organization's existing information systems, and pull in feeds from content providers.
- E-mail allows for the tracking and sending of emails. E-mail provides ongoing feedback and promotes communication between students.
- A mathematical equation editor using an intuitive interface is integrated into Prometheus. When accessing the equation editor, the user is presented with a library of user-defined equations; each user can have a library of their own equations.
- An electronic reserve system interfaces directly with the library. This system allows faculty to request a reserve from the library online and have the reserve placed back into the course as a course reading.
- A chat environment allows for voice and text chats, a whiteboard, display of slides, a polling feature, and the ability to log transcripts. The chat represents a synergy of synchronous communication and promotes a community of learners.
- The discussions section allows course members to conduct asynchronous threaded discussions by posting comments to a discussion board under a particular topic(s). The chat promotes student-to-student interactions, allows for archives, and reaches diverse learning styles.
- The Prometheus testing and surveying feature accepts multiple-choice, true/false, short-answer, and long-answer questions. Test scores can auto populate the grade book feature as well. Tests can be used to monitor progress and not just used to assign a rating. Using "low stakes" exams can result in a more expansive view of assessment.
- Rich media (graphics, animation, streaming audio or video) can be accessed and a keyword search of mpeg video is possible. Thus students have the power of visual explanation, simulations to real experiences, ability to travel beyond the classroom experience, and such media appeal to different learning styles.
- Modularized content can be created that makes content more mobile, allows for access on demand, and allows students access to material as needed.

Basic Course Redesign

As you create your course these key points can guide your process:

- Think about a course structure that doesn't rely solely on lectures to distribute information. What types of delivery methods and interactions can help to students to realize the course objectives? You may need to design activities that provide direct instruction, such as a study guide or connected readings.
- When designing student activities, be sure that you are explicit in your directions. Build into the course procedures to help students access their progress and to keep on pace.
- Examine ways to provide interactions and find ways to humanize the online experience. One study found that virtual business teams function better if they spend time getting to know each other as humans first before they became conduits of e-commerce. You can encourage student responses, you can joke with them, you can share with them…create an open, friendly learning environment.
- Build into the course procedures to help students access their progress and to keep on pace.
- Be prepared to actively provide information to students since online instructors must learn to hear the unasked question behind the words on the screen. You need to also think about ways to create connections among students beyond email and synchronous chat. You can use online discussion areas to support group-oriented projects, problem-solving among classmates, and as a forum to in-depth

subject analysis. It is up to you to encourage a sense of class community and provide opportunities for such interactions.

Conclusion

Whether a class involves synchronous and/or asynchronous activities, the role of the instructor is to facilitate learning, guide instruction, provide resources, evaluate outcomes, and manage communication and to be responsive. The use of a courseware tool can prompt faculty to develop learner-centered instruction. Prometheus allows learners to effectively access course materials and participate in learning activities. Tools have been added to Prometheus to make it easier for learners to do their work in the application. With the addition of features such as the HTML and equation editor, and the foreign language capabilities, instructors can deliver rich content to their learners. As development in Prometheus progresses, additional tools will be added to provide users with a more robust learning management system.

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Biographical Sketches

Dr. Kathy J. Schmidt is the Manager of the Faculty Innovation Center (FIC) for the College of Engineering at the University of Texas at Austin. The staff in the FIC assist in the creation of educational media and makes new media tools easy and accessible to enhance the learning experience. Kathy has over eighteen years in designing technology-based education in higher education, K-14, the military, and the private sector. She also has teaching experience at the university and community college level, including both traditional and online instruction, and has published in the areas of instructional design and technology-based instruction.

E-mail: k.schmidt@mail.utexas.edu
Phone: (512) 232-1536

Brad Beecher is a Field Engineer for Prometheus, a department of The George Washington University in Washington, DC. He is one of the original three programmers of the courseware tool and has been with this project for the past two and a half years. During Brad's time with Prometheus he has also provided end users with support services and worked extensively with faculty to train them to use the application. Currently he is providing technical support services to university looking to use Prometheus, by helping university work through any technical issues regarding implementing the courseware tool on campus.

E-mail: bbeecher@gwis2.circ.gwu.edu
Phone: (202) 994-9373

Technology for Teaching and Learning Academies: Technology Training Can Make an Impact

Melody Schopp
Curriculum Technology Specialist
Office of Technology, Department of Education, South Dakota

Over the past several years Governor William J. Janklow of South Dakota has initiated an aggressive program to bring the benefits of technology, including telecommunications technology, to South Dakota schools in order to enhance educational opportunities for students in the State. Proper training of teachers in using and integrating this technology effectively in their classrooms is seen as a priority in the State of South Dakota.

In 1997, the Governor initiated the first month long Technology for Teaching and Learning (TTL) Academy. Now entering its fifth year, this very successful staff development academy provides teachers with skills and knowledge that enable them to create new and more engaged learning environments for their students through the integration of technology into curriculum. Academy graduates become part of a growing network of teachers who have become technology integration mentors to colleagues within their local districts and who act as effective community-wide advocates for the integration of technology into classrooms.

TTL was launched as one strategy in the Governor's larger plan to create a robust technology infrastructure for South Dakota. This plan included:

Wiring the Schools – This effort assembled teams of prison inmates to wire schools and other institutions. The project has resulted in three computer drops for every four students in every classroom, Cat5 and fiber optic wiring throughout the schools, and upgraded the electrical wiring to manage the greater electrical demands of numerous computers.
Connecting the Schools (CTS) – Starting in 1999, the Governor began another phase of his efforts to bring schools together with his Connecting the Schools initiative. http://cts.state.sd.us CTS brought T1 access into every public school building K-12. The Connecting the Schools project established a statewide network called the Digital Dakota Network (DDN). Internet access, e-mail services, and video conferencing capabilities are provided free to all public schools. (Digital Dakota Network – http://www.ddnnet.org)

In addition, the U.S. West Corporation (know as Quest), donated $17.1 million worth of two-way video conferencing equipment to South Dakota in 1999. These systems were placed in almost every high school and freestanding middle school. These LC5000 VTEL units became part of the DDN and are supported with both scheduling and technical issues by the state of South Dakota.

Academy Structure

The TTL Academy month long experience immerses teachers in learning not just the technology, but teaching strategies for technology integration. It is, however, a yearlong commitment and as teachers return to their districts, they participate in a follow-up experience using a statewide asynchronous distance learning environment of WebCT. This allows them to continue to collaborate and support one another in the implementation of technology into their teaching. The 2001 Academy follow-up will have the added benefit of using the statewide video-conferencing equipment to communicate with each other in their follow-up experience.

Traditionally the Academies have been hosted on University campuses across South Dakota at Black Hills State University, Northern State University, and Dakota State University. Teachers were provided room and board for their month long stay. A "drive-in" Academy was developed in the summer of 2000 on the campus of Southeast Technical Institute. In the summer of 2001, it was determined that the Academies would be expanded into 32 local school districts across the state, to help entice those teachers who were finding a month long stay away from families to be difficult. These were in addition to the two campus locations at Black Hills State University and Northern State University. The teachers attending TTL are paid a $1000 stipend, and another $1000 is given to the school district to support any technology needs the teacher may have upon return to the classroom in the fall. Three hours of graduate credit are offered for the summer academy at a reduced cost as well as three credit hours for the yearlong follow-up work. By the end of the 2001 summer, approximately 3750 teachers will have participated in the basic TTL training.

These Academies were composed of a site team of a local network administrator, site coordinator, two student assistants, and an instructor from outside the school district. Site teams were brought together for a weekend for training as well as team building. Video conferencing played an important role in the training of staff in the months prior to the start of the Academies as meetings were held at sites all across the state. Each member of the team was given the option of obtaining graduate credit through one of the state institutions that focused on their role in facilitating an Academy and creating a portfolio to showcase the experience. K-12 teachers throughout the state have served as the instructional staff for the TTL Academy with state leadership being provided by the Department of Education and Cultural Affairs, the South Dakota Governor's Office, and TIE – Technology and Innovations in Education. University faculties on the campuses have provided leadership for fulfilling the requirements necessary for participants to receive graduate credit for their involvement.

Academy Content

The Academy teaches valuable technology skills including word processing, spreadsheets, presentation tools, and web development. More importantly, however, TTL focuses on how teachers can effectively integrate the technology back into their classrooms. During the TTL Academy participants design Units of Practice that reflect the attributes of Engaged Learning and these units are implemented into their classrooms during the school year. (http://www.ncrel.org/sdrs/areas/issues/content/cntareas/math/ma2lindi.htm) Starting in the summer of 2001, participants submitted their Units of Practice to the Apple Learning Interchange. (http://www.ali.apple.com). The follow-up continues to support teachers throughout the school year as they begin using their newly acquired technology skills and as they carry out their Units of Practice with their students.

Additional Academies

In 1999, Governor Janklow expanded his training initiative to include school administrators (TTL for School Administrators) and network administrators (TTL for Network administrators). Instead of developing instructional units, TTL SA participants concentrated on examination of educational technology issues that are of concern to administrators. Some of these included supervision and evaluation in a technology infused environment, administrative uses of technology, technology planning processes, budgeting for technology, technology staffing issues, and technology related curriculum issues.

TTL for Network administrators (TTL NA) was also added in 1999 to help insure that all school districts had one or more individuals on their staff with the knowledge, skill, and expertise to create and maintain their local area networks. All participants completed a rigorous course of study that included salient elements of the Microsoft Official NT curriculum. In keeping with the heritage of the TTL academies, TTL NA participants gained valuable training and experience through "hands-on" instruction that included disassembly, re-assembly, and configuration of high-end servers that were made available through a program that provided servers to every school district in the state.

When the high-end 2 way audio/video systems were placed in the schools across the state in the spring of 2000, it was determined that training and support was necessary. In the summer of 2000 a Distance Teaching and Learning (DTL) Academy was made available to South Dakota educators. The focus was placed on the basics of operating the video conferencing equipment but more importantly, adapting curriculum for distance delivery. Opportunities were provided for participants throughout the school year utilizing the Digital Dakota Network's videoconferencing capabilities. Additional DTL academies were held in the summer of 2001 across the state in 17 local school districts. Teachers will continue to use the WebCT as well as the 2-way audio/video systems to collaborate throughout the school year.

The newest academy added in 2001 is Advanced TTL, which has been developed as the direct result of the interest and requests of Basic TTL academy graduates and others interested in having an opportunity to extend their technical skills and capabilities. Advanced TTL is a two-week residential academy focusing on advanced technologies of Microsoft Office, Web Page development, Personal Digital Assistants (PDA's), Digital Editing, and Video Editing. This fast paced Academy continued to emphasize the use of these technologies in the classroom and teachers were able to obtain graduate credit with the creation of a Unit of Practice. 170 teachers took advantage of this Academy, and were rewarded with their own PDA.

Reflections

The ultimate goal is that "the TTL participant will model life-long learning in technology to improve both skill levels and integration practices related to instructional technology." However, teachers walk away with even more than they anticipated. Perhaps one of the highlights of the TTL are the friendships, collaboration, and the sharing of ideas between teachers. Their newly developed technology skills give them a confidence to go back and become the innovators and technology leaders in their districts. As one participant stated, "I really feel this will be the springboard for me. It has given me a confidence I didn't have before. The assessment and engaged learning aspect is a very high interest area for me. I think I am taking a new energy back to my classroom." (TTL 2000 participant)

For more information, visit the South Dakota TTL website at: http://www.sdttl.com.

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Biographical Sketch

Melody Schopp is a Curriculum Technology Specialist for the Office of Technology in South Dakota. She has 21 years of teaching experience, with 12 of those in the area of technology for K-12. She has her Master's Degree in elementary education with an Endorsement in Technology. She is currently working on her doctorate Educational Administration via distance from the University of Lincoln, Nebraska. Ms. Schopp has been involved with the TTL Academies for the past 4 years and was the project manager for TTL in 2001. She has presented at both state and national conferences and was featured on CCN.com in a segment put together on technology in the rural areas of South Dakota. She served on an advisory committee for the Federal Reserve Board in Minneapolis to discuss broadband access in the state of South Dakota. She was recently appointed to the Governor's Educational Task Force in South Dakota in the role of a school board member.

Address: 12178 SD Hwy. 73
Meadow, South Dakota 57644
E-mail: melody.schopp@state.sd.us
Phone: (605) 788-2243 (Office)
(605) 280-1250 (Cell)

Overview of Policies and Practices
for Successful Scaling of Online Learning Programs

Ray Schroeder
Professor of Communication
Director of Technology-Enhanced Learning
University of Illinois at Springfield

Harry J. Berman
Associate Vice Chancellor for Graduate Education
Research/Associate Vice Chancellor for Academic Planning
University of Illinois at Springfield

This presentation will identify issues to be addressed as institutions scale up delivery of online instruction. Using the experience at the University of Illinois at Springfield (UIS) as a model, the presentation highlights the some of the challenges of scaling up from offering a few online courses to offering entire programs.

At UIS online education has grown from 30 enrollments inn Fall 1998 to 800 enrollments in Spring 2001. The experience at UIS indicates that among the challenges to be addressed in scaling up online offerings are

- factors related to the selection of curricula for online delivery;
- factors related to faculty involvement with online instruction, including workload and rewards, faculty skill development, and management of intellectual property concerns;
- factors related to technical support, including the structuring of an online education support unit;
- factors related to students, including student demographics, as well as tuition and fee policies; and
- factors related to marketing of online degree programs, including the development of partnerships.

Institutional background

Located in the capital of Illinois, UIS enrolls approximately 4000 students in 20 bachelor's, 18 master's, and one doctoral program. UIS was established in 1970 as a senior institution, offering the third and fourth year of undergraduate education, as well as professionally oriented master's degrees. At the undergraduate level, therefore, all students are currently transfer students, many of whom are returning adult students, coming to UIS from regional community colleges. (In fall 2001 the campus will admit an initial class of first-year students.) At the graduate level the campus draws from a broader geographical area, with many students attracted to the campus by graduate assistantships and internships in state agencies.

Online learning at the University of Illinois at Springfield emerged from longstanding institutional commitments to serving the needs of adult learners and to educational innovation. These commitments led to a strong response among the faculty to a system-wide initiative known as the University of Illinois Online. At the outset, UI-Online provided broad-based support for development of any online course. UIS faculty responded enthusiastically to this opportunity. Over time, the emphases of UI-Online and of UIS shifted toward the development of entire degree or certificate programs, with concomitant concerns about resources needed to sustain such activities should the services of the online pioneers no longer be available.

Challenges associated with the growth of online instruction at UIS have highlighted the significance of one fundamental assumption made without question at the outset, as online courses were first being developed.

That assumption was that online courses and curricula would be offered by regular faculty as part of their regular workload and administratively would fall within rather than outside of the academic departments. This approach contrasts with models of distance learning in which courses are delivered by units other than the standard academic departments (such as a division of continuing education) and conceivably by faculty other than the regular faculty.

Prior to the development of Internet-based education, UIS had engaged in distance learning in a variety of forms for virtually its entire 30-year history. For example, the campus had an off-campus site in Peoria, a distance of approximately ninety miles, to which faculty traveled to deliver degree programs in management, criminal justice, and nursing. The campus had offered sideband radio courses, broadcast TV courses, and interactive compressed video courses. The aim in all of these distance-learning activities was to provide an educational experience as comparable as possible to the face-to-face on-campus experience and not to differentiate distance learning courses from on-campus offerings either in terms of instructor or in terms of a course's applicability to a degree. The assumption with respect to distance learning courses was consistent with the assumption in the delivery of evening courses. Again, unlike other models for evening course delivery, at UIS courses taught in the evening are taught by regular faculty as part of normal workload and administratively fall within the academic department. A degree earned through night classes is identical to a degree earned during the day.

It was natural, then, that, when the campus began to offer online courses, faculty and administrators assumed without question that the same approach would apply. It is fair to say that at this point in the development of online curricula the implications of that initial assumption for continued growth of online programs have become increasingly evident. Though UIS's approach does much to assure of the quality of distance learning, at the same time it constrains growth in ways that will be highlighted later.

Selection of Curricula for Online Delivery

It would be comforting for those of us who work in academic planning to think that the development of online curricula proceeds in a rational fashion and that the selection of curricula for online delivery proceeds from identification of need to securing of resources and then to course development and delivery. However, comforting as such a thought might be, it would also be the height of self-delusion. The fact of the matter is that a variety of factors relating to social, institutional, political, and personal needs combine to influence the selection of curricula for online delivery.

At UIS, the impetus for transforming a curriculum from face-to-face to online delivery has arisen from four sources. The first source is faculty. Some online curricula have been developed because faculty identified the need for developing an online version of the curriculum to meet student needs or to maintain competitiveness. A second source is the system (i.e. University of Illinois). For one of UIS's online degree programs a system-level committee identified a UIS degree program as suitable for online development and complementary to other university offerings. A third source is a non-educational governmental agency. UIS was approached by one such agency to develop a certificate program for its staff. The fourth source is the statewide higher education coordinating agency. In Illinois this agency has identified goals for online education and has provided incentive funding to public universities to achieve its goals.

Given the prevailing assumption that online coursework will be delivered by regular faculty as part of regular departmental offerings and given the size of the faculty (165 faculty with no use of teaching assistants), it seems likely that the campus is approaching the limit of its capabilities for offering new degree programs. With the addition of one or two more degree programs, emphasis will shift from the creation of new degree programs to building the visibility and size of the existing degree programs.

Faculty issues

Workload

As noted earlier, online instruction at UIS is a part of regular faculty workload. Thus, in most cases online courses are delivered by tenured and tenure-track faculty rather than by part-time instructors or teaching assistants. The institution has a long history of rewarding innovations in teaching. Since the early 1990s, faculty personnel policies have explicitly recognized the Boyer model of scholarship, under which faculty may choose to focus their scholarly efforts on pedagogical research related to online instruction.

Some scaling up of offerings will be possible through overload assignments. However, too heavy reliance on overload assignments detracts from the campus's desire to foster scholarly productivity among its faculty. Therefore, as the opportunity for increasing enrollments through online offerings has become evident, faculty and administrators have begun to question the assumption that online courses should be taught exclusively by full-time faculty as part of the regular workload. A relatively non-controversial deviation from that assumption is for retired UIS faculty to offer online courses. These are faculty whose performance had been judged satisfactory through tenure and post-tenure review processes. They don't stop being highly talented teachers merely because they have retired. They therefore constitute a cadre of people potentially available to help scale up offerings at little or no risk of compromising quality.

At a somewhat higher risk level would be the possibility of recruiting retired faculty from other institutions to teach sections of online courses. This would be particularly appealing if the faculty had been recognized in their careers as outstanding teachers and were acquainted with members of our faculty.

Another somewhat risky approach (from the perspective of UIS' history) to scaling up offerings at UIS would be to use graduate teaching assistants to manage sections of online courses under the tutelage and supervision of a regular faculty member.

With all three of these modifications of UIS' current approach to staffing online courses, it would be critically important to provide faculty development opportunities comparable to those offered to the regular faculty engaged in online instruction.

Faculty Development

From the outset, a key element of UIS' online efforts has been faculty development. An Office of Technology-Enhanced Learning was developed within the Center for Teaching and Learning to provide support for the online effort. Workshops, symposia and seminars are hosted monthly on the campus to deliver technological foundations and pedagogical support to faculty. The online-l email discussion list delivers daily updates on news from the field of online learning to subscribing faculty. The Illinois Online Network, a unit of the University of Illinois Online in university administration, provides a series of ongoing online workshops entitled "Making the Virtual Classroom a Reality" for faculty members who are teaching online. A "Master Online Teacher Certificate" is offered to those faculty members who complete a selected array of six of the month-long workshops.

Intellectual property

Intellectual property issues are addressed through the university's intellectual property policy. Early in the development of Internet-based education, a system-wide committee provided guidelines for the application of that policy to courseware agreements. Over fifty such agreements have been developed with UIS faculty, covering a broad range of situations. The processing of intellectual property agreements is coordinated by the office of the Associate Vice Chancellor for Graduate Education and Research. One of the challenges associated with the scaling up of online courses has been that the tracking the status of intellectual property agreements has become a significant new component of the responsibilities of that office.

Technical Support

Technical support is provided on multiple levels. The Campus Computing and Network Office provides a DS- 3 connection to the Internet capable of up to 45 mbps, assuring that adequate bandwidth is available to deliver the online curriculum. The Academic Computing Office maintains eight online servers that deliver the course management systems, discussion boards, streaming of lectures, library electronic reserves and related course materials for the online programs. The Office of Technology-Enhanced Learning provides technical support to faculty members. The Technology Help Desk is available seven days a week to support faculty and students at a distance through walk-up, toll-free phone, and email.

Students

A significant administrative concern has been the degree to which the campus is attracting new students through its online offerings, as opposed to merely creating an opportunity for students to shift from on-campus to online courses. Data for Fall 2000 indicate that over half of UIS' online students live outside of the campus's immediate geographic area (defined as the county in which the campus is located and all contiguous counties). Moreover, students are drawn from both the far northern and far southern parts of the state, as well as (at present) from 12 other states. As the campus has scaled up online education, it has also become imperative to address tuition and fee policies. To date, the campus has initiated an online course fee. Under the online course fee policy, certain fees used to support campus auxiliary facilities and services are waived for students who take online courses exclusively. At the same time, an online course fee is assessed for *all* students in online courses, irrespective of whether they are also taking on-campus courses.

However, the very nature of online education has prompted an examination of not only appropriate fees, but also appropriate tuition. As a public institution in Illinois, the campus charges three times the in-state tuition to out-of-state students based on the rationale that Illinois taxpayers underwrite approximately two-thirds of the costs of a public education. Historically, out-of-state students were those who moved to campus and used campus facilities while taking their courses. But such is not the case with out-of-state online students. These out-of-state students are certainly using the instructional resources supplied, in part, by the citizens of Illinois, but they are not using the campus's physical facilities. The challenge is to determine a special tuition rate for out-of-state students that fairly represents the costs of instruction and to ensure that the rate is made available only to the true, non-residential out-of-state students.

Another concern has been the ethnic diversity of online students, that is, whether the diversity of online students is comparable to that of the on-campus students. Fortunately, data indicate that the ethnicity of online-only students is very comparable to that of on-campus students.

Marketing

With the increasing amount of online coursework available, all institutions are faced with the challenge of marketing their programs. Although UIS has experimented in a limited way with print advertising and direct mail approaches to marketing online courses and programs, one of the most successful components of the scaling up of online education at UIS has been the development of partnerships for publicizing the campus's online degree programs, especially partnerships with community colleges. More than 25 community colleges are now listed as partners with the UIS baccalaureate degree completion program. The process of developing these partnerships has yielded broad benefits to the campus that extend beyond the recruitment of students for online programs. Specifically, the development of partnerships relating to the enrollment of community college students in online degree completion programs raises the profile of UIS at those community colleges and increases the likelihood of the physical transfer of students to face-to-face courses.

Biographical Sketches

Ray Schroeder is Professor of Communication, Director of the Office of Technology-Enhanced Learning at the University of Illinois at Springfield and Faculty Fellow to the Vice President for Academic Affairs for the University of Illinois. As Professor of Communication, he has taught half a dozen online classes. As Director of Technology-Enhanced Learning he led the campus online initiative. As Faculty Fellow, Schroeder chairs a committee to develop an online faculty compensation policy for the university and co-chaired the development of a strategic plan for the University of Illinois Online. He is a Sloan Consortium Distinguished Scholar in Online Learning.

Address: HRB-79
University of Illinois at Springfield
Springfield, IL 62794-9243
Email: schroeder.ray@uis.edu
Phone: (217) 206-7531

Harry J. Berman is Associate Vice Chancellor for Academic Planning/Associate Vice Chancellor for Graduate Education and Research and Professor of Human Services at the University of Illinois in Springfield. He has published eighteen refereed articles and chapters on his research on psychological aspects of aging and has made over forty presentations at professional conferences, including presentations at the Midwest Association of Graduate Schools and the Council of Graduate Schools on changes and trends in master's institutions. He is the immediate past president of the Illinois Association of Graduate Schools.

Address: PAC 521
University of Illinois at Springfield
Springfield, IL 62794-9243
Email: berman.harry@uis.edu
Phone: (217) 206-206-7411

Open Source: The Impact of Community-Based Development on Education Technology and Content

Sharra Smith, Vice President
Education Services
Coursemetric Corp.

David Harden, CEO
Coursemetric Corp

Open source software development has arrived upon the doorstep of Education with much fanfare this year. Two major announcements detailing plans for both open source e-learning platform and open course content from the Massachusetts Institute of Technology have drawn the most attention. But beyond the MIT announcements, the emergence of open source tools for e-learning like uPortal or the ArsDigita Community Education System (ACES), the academic-links to the origins of open source, and the still rich development capabilities within the computer science departments of North American universities suggest open source could play a significant role in the next generation of technologies for education.

What Is Open Source?

Definition

Although there are subtle differences in definition amongst open source's diverse community, the philosophy is centered around the belief that intellectual property, including software code, should be shared and open.

GNU's Not Unix (GNU), a well respected organization in the open source community, promotes the following definition of open source software or free software:

Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it refers to four kinds of freedom, for the users of the software:

- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits. (freedom 3). Access to the source code is a precondition for this. (Free Software Foundation, 2001)

The word "free" in this instance is not related to price, but to freedom. Richard Stallman, formerly at the Massachusetts Institute of Technology Artificial Intelligence Lab and the originator of the free software concept, offers this clarification: " 'free software' is like 'free speech' not 'free beer'." A copy of the source code must be available somewhere, usually the Internet, for people to download and run. But anyone has the freedome to package the code, integrate other applications, add installers, and distribute the software on CDs or other easy-to-use forms, and charge others any price for copies (although it is not likely that people would pay exorbitantly for something which would be available for download somewhere without charge.) To avoid confusion regarding the term "free" and its monetary connotation, the authors of this paper have chosen to use the term "open source software" instead of "free software."[i]

Open Source Software Licenses

Software that is governed by a license that upholds these freedoms, such as the General Public License[ii] (GPL) is considered open source software. The GPL, unlike some free licenses, goes even further with its "copyleft" (as opposed to copyright) clause which mandates that modified and/or redistributed versions of software governed by the GPL must also use a license that upholds the freedoms guaranteed by the GPL.

On the contrary, the more common proprietary software licenses usually restrict use of a software application to one computer, or sometimes one student, and often have recurring fees for each year of use. Users may not access the source code, so they cannot modify the software. And of course, users are not allowed to redistribute the code.

The ArsDigita Example

ArsDigita[iii] developed a toolkit for developing interactive websites called the ArsDigita Community System (ACS) which is governed by the GPL. MIT's Sloan School for Management contracted with ArsDigita to customize ACS to fit the requirements of an interactive higher education portal. The development effort resulted in the ArsDigita Community Education System (ACES) and was rolled out to all 700 Sloan students Spring 2001[iv]. Because ACS was licensed under GPL, modifications, such as ACES, must also be publicly available. Anyone may download ACES, modify it or improve it, deploy it on any computer/s, and/or redistribute it for free or for a charge. Institutions can continue to build on each other's enhancements creating a rapid evolution of the product.

Open Content

There are some in the open source world who believe that intellectual property in the form of content should also be shared and open. GNU has created a license specifically for content that upholds the same freedoms as the GPL, called the General Free Document License[v] (GFDL).

The MIT Open Course Ware Project, (OCW) the goal of which is to make all content for MIT courses freely available via the Web, has created a buzz in the education space around open content. In this instance "freely available" doesn't necessarily equal "open". As the copyright for MIT's content will continue to be owned by the instructors and the institution, it is unclear at this early stage how open MIT's content will actually be. MIT has stated a desire to see other institutions around the world use the OCW content to develop their own cutting edge engineering curriculum, and obviously a truly open format would facilitate this kind of use. Beyond MIT, there are several other open content initiatives with education elements or focus. The OpenText Project[vi] and Andamooka[vii], which host open text books, are two examples of projects with an education focus facilitating collaborative authoring and peer review. Given the importance of content to the education economy, especially in the form of textbooks, open content issues will have a significant impact on the industry in the future.

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[i] It should be noted that the definitions of "free software" and "open-source software" differ slightly and are considered distinct by the originators of the definitions. Many software companies, state that they are "free and open-source" to cover both definitions. For the purposes of this introductory paper, we will consider the two terms analogous.

[ii] To view full text, see http://www.gnu.org/copyleft/gpl.html.

[iii] http://www.arsdigita.com

[iv] For a case study description of this project, see http://www.arsdigita.com/customers/casestudies/mit.adp

[v] To view the full text, see http://www.gnu.org/copyleft/fdl.html

Open Source and Higher Education

Open source and higher education have a long history together; higher education has housed and funded many of the computer science labs and programmers producing open source software. Recent events and announcements would suggest that education and open source will be reuniting with significant mutual benefit.

History of Open Source

Academia was the birthplace of both open source philosophy and some the first significant open source development. In September, 1983, Richard Stallman, a leading programmer at the Artificial Intelligence Lab at MIT, began to develop a complete Unix-compatible operating system, called GNU, that would be "free" (as in the GNU freedoms). His work with GNU, married with Linus Torvalds' project, called Linux, originally created for a course at University of Helsinki, became the first fully functional open source operating system, GNU-Linux. At the same time, UC Berkeley engineers were developing another open source operating system, BSD.

Technology Issues in Higher Education

Most institutions are endeavoring to integrate technology into all aspects of their institutions from delivery of content to interactive community portals to administrative processes like registration and transcripts; and most of these institutions are struggling with the same issues:

- Software and hardware required to integrate technology into the campus is costly, and budgets are often limited.
- Human resources needed to build, maintain, and improve software are not available.
- Off the shelf software available to provide technology-mediated education is inadequate or doesn't meet the needs of a specific institution or organization.
- Quality technology-based content is not available.

Benefits of Open Source Software for Higher Education

Open source technology and content models can contribute significantly to solving the above issues. Additionally, the higher education environment is one in which open source models should thrive.

Low costs of software. Open source software development efforts, called projects, rely heavily on volunteers for development. Often, volunteers build features that they require for their own use and then they contribute these features to the project. This keeps the cost of software down. In addition, whereas proprietary software licenses require that consumers pay separate fees for each computer or each user, with open source software there are no such fees. One can imagine the enormous savings that would result if a

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[vi] http://www.opentextproject.org

[vii] http://www.andamooka.org

5,000 student campus only paid for one CD, rather than for seat licenses per student per year. (As explained above, the market would require the price for the CD to be relatively low.)

Customization and flexibility. Many institutions steer clear of off the shelf software applications because they do not allow for the customization and flexibility required. Higher education has a history of the "Not Invented Here" attitude; applications not built on campus will not be used on the campus. However, building software is not usually a core competency of an institution and campus resources are needed elsewhere. In addition, many campuses would be re-inventing the e-learning platform wheel. Open source allows for institutions to participate in the development process, while capitalizing on work done at other campuses. Institutions can modify software to fit their specific needs or may find their needs met by development efforts at other campuses. This model may provide a happy medium for campuses that were reluctant to swing the pendulum to the "buy" side of the "build vs buy" equation because they wanted control over the product, yet campus IT resources will not be drained to reinvent the wheel.

Rapid evolution of software. Higher education a whole has deep computer programming resources. The open source model allows resources across all campuses to work collaboratively to build software. With every campus improving upon their neighbor's enhancements and thousands of users reporting and fixing bugs, evolution of the software can be very rapid.

Current Open Source Initiatives in Education

Recently there has been a surge in open source initiatives in education. The Mellon Foundation is funding many institution-based projects. Ira Fuchs, the VP of Technology for the Mellon Foundation explains his current grant philosophy which enthusiastically supports open source development as follows, " The immediate priorities are new collaborative projects that will counter the current trend toward commercial software solutions and proprietary code - projects that celebrate our ability to share information and solve our problems collaboratively."(Katz, 2001) Several companies are also forming businesses around supporting open source technology in education. (See Table 1.)

Conclusion

In a very short time period, the open source model "took over" the Internet infrastructure market. Today, the majority of Web servers (Apache—62%[Ruepell, 2001]), mail servers (Sendmail—80%[Sendmail, 2001]), and Internet related server operating systems (Linux—36%[Ruepell, 2001]) are powered by open source software. Recently the open source movement has been gaining momentum in higher education. The characteristics and culture of higher education and the open source model have many synergies, and if joined together, could result in a rapid evolution of high quality education technology products. Today's products are still in relatively early stages of development and only a handful of institutions are actively involved in development. Higher education would greatly benefit from an increased awareness of open source, increased involvement in open source projects, and, as per Fuchs advice, a shift toward collaborative and shared software development.

Table 1: Open Source Related Initiatives In Education

Company	Products	Comments
ArsDigita www.ardigita.com	Community website platform geared for elearning	ACES, an open source education portal/elearning product, is publicly available under the GPL
Interactive Business Solutions www.interactivebusinss.com	Consulting, custom development, and integration for higher education applications	IBS is currently the only provider of custom development and integration services for uPortal, an open source portal project led by the Java Administration Special Interest Group, (JA-SIG)
JA-SIG/uPortal www.ja-sig.org	Portal application for higher education	uPortal is a collaborative effort, led by JA-SIG, to develop an open source portal technology for higher education.
Open Courseware Project http://web.mit.edu/newsoffice/nr/2001/ocw.html	An effort to make all MIT course content publicly available via the Web	MIT's goal is to allow other institutions to build engineering curriculum based on their content. Although MIT's instructors retain copyright over the content, the project is a major step toward open higher education content.
Open Knowledge Initiative	Open standards and a prototype for elearning platforms	This development effort led by MIT has the participation of over 40 colleges and universities. It is still in its early stages.
OpenMinds Publishing Group www.ompg.com www.opentextproject.org	Online texts which instructors can combine and modify before printing	OpenMind content can be modified by instructors. Their content has some copyright restrictions, but capitalizes on benefits of the open source model. They also sponsor the OpenText Project.
Prometheus www.prometheus.com	"Community source" elearning platform	The Prometheus elearning platform is "community source". After paying a significant fee, licensees can access the source code, make modifications, and share modifications with other licensees.

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Bibiograpical Sketches

Sharra Smith is co-founder and vice-president of Coursemetric Corp, a software and services company dedicated to providing quality information to education institutions to improve campus decision-making. After earning a BA in Human Biology and an MA in Education, both at Stanford, Sharra taught science at the secondary level. She also designed educational software at Lucas Learning and NASA before starting Coursemetric in October 1998.

Address: CoursemetricCorp
1600 Shattuck Ave, Suite 10
E-mail: sharras@coursemetric.com
Phone: (510) 548-9507

David Harden is the CEO of Coursemetric Corp, an online learning evaluation and information services company. He has in-depth experience in Web technologies, Internet marketing and networked learning. Harden has published numerous articles on the subjects of science and visual systems of communication. He did his doctoral work at UCLA, working as an instructor in the History of Science program, and a received a BA with Honors from Stanford University.

Address: CoursemetricCorp
1600 Shattuck Ave, Suite 10
E-mail: davidh@coursemetric.com
Phone: (510) 548-9507

For the Students: Developing Support Services for Online Learners

Susan Smith
Online Student Services Developer
Weber State University

Why bother? Why should we expend time and resources to develop and provide support services to online students? Where's the proof that results will be worth it? Why online? Can't the students just come to campus to access the services? Isn't an e-mail address good enough? My short answer: Because students are beginning to *expect* web access to services and when we provide them more students are able to access services faster and better, and when they can access services better, they learn better.

The Western Cooperative for Educational Telecommunications (WCET) recently published a "Guide to Developing Online Student Services" which is the final product of a three-year FIPSE funded project of the WCET entitled "Putting Principles into Practice: Promoting Effective Support Services for Students in Distance Education Programs." While the project concentrated on Distance Education programs, the Guide is based on the assumption that an institution should design its online services to be available to any student, specifically those who have sought the anywhere, anytime convenience offered by online programs and courses. This has been the underlying premise in developing Student Support Services for WSU Online.

Background Information on WSU Online

WSU Online is the online campus of Weber State University. Weber State is a metropolitan, public, commuter, four-year institution located in Ogden, UT. We focus on undergraduate education, offering associate and bachelor degrees and only four graduate degrees. WSU Online was launched in the Autumn of 1997 and now offers more than 240 courses per semester and has over 5000 enrollments per semester. The majority of our online students (78%) also take courses on campus (first-time login statistics, February, 2001.) Therefore, we are concentrating on developing support services that will benefit campus-based students who are also taking online courses.

From the beginning, WSU Online was conceived as a complete campus - providing both instruction and support services, thus the Online Services Developer position was created. The job description includes accessibility; developing and implementing student communication features & functions for online degree programs; development of student services; assisting WSU online students with enrollment, fee payment and related issues; planning and implementing WSU online program assessment activities; and staying abreast of trends in online academic support services. During the first year of WSU Online, the WSU President's Council determined that the student fee money for all the online enrollments should be diverted into a special account to provide support services. The CIO (chief Information Officer) gets a portion and the rest comes to Continuing Education, which is where WSU Online reports. This money funds the Online Services Developer position and it is used to fund activities that directly support the students of WSU Online.

Student Services Survey

In the summer of 2000, a survey of our online students was developed to assist in the development of priorities to use in developing online student services. The survey is online, using ChiTester, a testing program developed at Weber State for online courses. As indicated by the survey results, Advising is the biggest concern of our students and some of the other projects I have deemed priorities – such as tutoring – also came up high on the list.

A list of the questions we asked and the responses is available online at:
http://wsuonline.weber.edu/presentations/NASPA2001/onlinesurveyresults.htm

Services Offered by WSU Online

The majority of the tools and systems used in WSU Online have been developed at Weber State by our small but very effective team. The most critical online student services, such as admissions, registration, and fee assessment, have been fully integrated into our home-grown student information system (STAARS) from the beginning. Of course, this meant some re-programming on the part of STAARS, but because of WSU Online, all of our Weber State students have the advantages of online services. We allow all students to use the online registration and student information system. This has made our students happy. Since the online registration system went up (also for Fall, 1997) the number of students using the system has increased from 10% to 50%. Registration now is very simple and the interface created feeds all our other WSU Online systems, including login, the online gradebook, and the portfolio.

Student Information/Registration

Kiosk system. During the implementation of student registration and information services for WSU Online, when it was determined that these services would be available for all students, a system of Information Kiosks was developed. Through these kiosks, students can access their grades, register for courses, print a graduation evaluation, and see their unofficial transcripts. Students also have links to course catalogs, testing schedules, the advising center, etc.

Graduation evaluation. One of the best functions of the student information system on the web is the ability for students to look anytime at their graduation evaluation - or degree audit. The student enters the information system using either their student ID number or social security number and PIN. Students can look at how their courses would fit into any major on campus, not just their declared major. This is very helpful for the undecided student.

Login system

Students access WSU Online courses through the Login System, fed nightly from STAARS, that allows only registered (and paid) students to enter the system using their Weber State Student ID number and a self-generated password.

Portfolio

The Web Portfolio provides for posting assignments and messages and for uploading files to the student's own personal (and private) file. This also allows the instructor to grade student work and provide feedback to the student. This system is also operated through a live feed with STAARS.

Technical Support Tracker

The Technical Support Tracker provides a method for seeking technical support during non-office hours. Students' messages and follow-up replies are kept in a database, allowing staff to know what problems exist and what support is given and to log recurring problems so improvements can be made. Aestiva's "Live Help" and HumanClick have been added to the technical support/advising support on WSU Online. These programs allow a staff member to "chat" with the student and help him/her resolve the issues of concern. Once we have determined which of the two live support programs the staff and students prefer, the other will be discontinued.

Tutoring

Online tutoring is provided through NetTutor, developed by Link-Systems. Math was the greatest tutoring need at WSU and this system allows us to have math tutors available at times other than the normal operating hours of the Math lab in the tutoring center. Currently, only Math is offered online for tutoring, but we plan to add subjects as need arises.

Advising

The majority of online advising is currently being done via e-mail. However, since students are becoming more technologically sophisticated and seem to like to use the Internet for everything, "Live Help" and HumanClick are also being used for this. Students report that having a "live person" to talk to for advice or technical assistance is very beneficial. Occasionally, an evening advising chat session is offered. This is well publicized and is held at registration times and just before and during the first weeks of the semester. This has also proven to be a helpful way of meeting online students' advising needs.

Career Services

Career Services has recently completed a new web site which has a link from WSU Online. This new interface offers a wide variety of services to students.

Library

Library staff have developed a wide range of services for online and distance learners, including catalog and database access, "ask a librarian" reference help, and basic library instruction (how to search, the difference between popular magazines and scholarly journals, etc.).

Bookstore

The Bookstore uses a shopping cart mechanism which allows students to select the necessary books and track a total price for their purchases. Students purchase books using their credit card via a secure server, and books are shipped by the Weber State bookstore within 5-7 working days.

Orientation to Taking Online Courses

An orientation to online learning is offered in 2 formats: online and a CD ROM. The reason that a CD ROM version is offered is to give students who may be a little hesitant to access the WSU Online site another way of getting the information without needing to be on the Web. The orientation gives students software and instructions that they need to access their courses and to make the online course experience a little more friendly.

Pulling It All Together

Lessons We Have Learned (or Pitfalls to Developing Online Student Services)

Know what your objective is. Clearly define what you are trying to do.

Don't re-invent the wheel. Don't hesitate to utilize a resource that has already been developed.

Bring multiple perspectives to bear on the problem. Students, faculty, staff, Information Technology, Distance Learning, etc. Determine who will "house" the services and move from there.

Let the faculty "sell" themselves. Online learning is not for everyone. Neither is online teaching. We develop the systems and keep what works.

Steps You Can Take in Developing Online Student Services

Again, know what your objective is and don't reinvent the wheel. Begin with the most universally needed services and add others as growth demands.

Equal does not mean identical. Since the majority of our online students are also taking courses on campus, do we *HAVE* to have all the services available online? Concentrate on the needs of the students and what is fair.

Make the online services and opportunities visible. This means you really need to think about how the students will navigate through the information provided. What will users have the strongest need for? How will they look for it?

Place new services or information where students can find it. Once students know where to start for course access, many of our students bookmark the log-in page and bypass the WSU Online home page, so, if I have a new service I want them to look at, where do I put it (or at least a link to it?) I try to put a link in several places and, then, if it is something I want all students to know about, I send out a general e-mail message to all online students.

Use terms that students can understand. Do they really know what "matriculate" means?

Focus on the service to be provided and the needs of the people being served rather than on technology. Creating a web site for a service just because other offices have one is a waste of time. Creating a web site that will "serve" the students is not.

Provide information and tools for students to assess their level of capability for utilizing the hardware and software necessary. Currently, many institutions offer a self-assessment on "is an online course right for you?"

Have a real person for students to contact. Make sure that, at some point, on every page, students have a place to contact a "real person" Whether this is a link in a navigation bar or an e-mail address at the bottom of the page, students appreciate knowing that they can contact someone "real" if needed.

Be patient with yourselves, as well as gentle and persistent. Don't assume that what you've tried will never work just because there are glitches in the first version. If we had everything we wanted in the first version, why is there a Word 2000? or new "Windows" versions every couple of years? We are a system of "new and improved's."

All you can do. The difficult we do right away. The impossible takes a little longer. But remember "All you can do" is really all you can do.

Think "long range and scalable." as you develop services.

If it's worth doing, it is worth doing. Period. If you wait until you're "ready" or until you "have enough time," or until the department you are working with is "ready," it will never get done or you will talk yourself out of doing anything at all.

So, Weber State has made a start in providing the same services as students can access on campus to students who take courses at a distance and, by doing so, have shown that it not only is possible, it is necessary. We did not try to do everything at once, and we didn't execute it flawlessly. WSU Online is a work in progress. We suggest that you start where you have some toeholds and keep a running log for improvement. Going online is both stressful and exhilarating. You'll draw on traditional values and hard-won experience from the face-to-face world while learning new skills, tools and ways of thinking.

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Biographical Sketch

Susan Smith is the Online Services Developer for Weber State University Online. Prior to accepting the challenge of designing and implementing online student support services, she was an technology specialist, academic advisor, career counselor, and projects coordinator. While in the WSU Academic Advisement Center, Susan developed a Virtual Advising Center for which she received an Award of Merit for Outstanding Academic Advisement Program from NACADA (National Academic Advising Association) in 1997. She has presented on technology in advising issues, designing advising web pages, using e-mail in advising, and on designing online student services at many local, state, regional, and national conferences.

Address: Distance Learning
Weber State University
4005 University Circle
Ogden, UT 84408-4005
E-mail: ssmith@weber.edu
URL: http://wsuonline.weber.edu/presentations/dl/
Phone: (801) 626-7218
Fax: (801) 626-8035

Distance Learning, Music Appreciation, and MP3

David Sonnenschein
Associate Professor of Music
Northeastern University

The original version of the music appreciation courseware *The Anatomy of Music* was designed as a hybrid CD-ROM/ Internet hypermedia program. Most instructors who teach distance learning courses will probably agree that a primary attribute of any Internet course is its "anytime, anywhere" study option. This is basically what distance learning is all about. By its very nature, music appreciation is confronted with a special problem in trying to deliver on this attribute. Music is the core content of any music appreciation course. Providing the distance learner with the music required for the course in an educationally meaningful manner is a challenge of significant proportions.

Though there are many individual variations, the average common content material included in a music appreciation course is made up of historical and biographical information, some music theoretical materials, and above all the music itself. A ubiquitous problem confronting music appreciation instructors, is how to teach students, who are mostly musically unskilled, to relate what can be read to what can be only be perceived by listening – the music. For example, a music appreciation text describes a passage in a particular concerto as being a varied version of the codetta of the tutti exposition. Any unknown word can be looked up in the glossary or in a music dictionary. But how is the learner to locate that passage while listening to the concerto; and further, how is the learner to compare the varied version with the original of which it is a varied representation?

A skilled classroom instructor can demonstrate by using a keyboard. While this and other methods are used frequently, their effectiveness is open to debate. What percentage of students actually benefit sufficiently from these methods so they can relocate these passages later when listening on their own to a performance of that concerto? Regardless, even these methods are not available for distance learning. A new tool had to be developed. A tool that would enable the learner to interact with the music in order to locate and compare musical event within a composition being studied.

Design Process

At the time *The Anatomy of Music* was being designed, the only practical solution for providing the learner with the required music for the course was to create special CDs that could be delivered to the learner. This single design element required resolving many licensing and production issues.

A decision was made early on in the design phase of the courseware that would significantly affect fundamental educational objectives: rather than pursue broad and general musical knowledge objectives, the program would concentrate on the development of listening skills in the learner. Listening would be the main venue for attaining musical knowledge as opposed to the conventional, mainly reading and lecturing, approach.

This was a profound shift in educational objectives and raised the question of what music-listening skills would be attainable within a one-term study period for a learner who is assumed to be musically unskilled. An answer was found in the fact that classical music designs – its forms – are based on specific syntactical arrangements. It was observed that most learners could perceive these arrangements quite easily if an interactive audio-visual tool, which allows for individual differences in learning skills, could be provided.

Because music is serial in nature, musical form cannot be observed by listening all at once in a single instance. The skill to observe musical form requires the learner to be able to auditorily track musical ideas that define the syntactic arrangements. The cognition of musical forms and the skill to track them can provide the learner with solid mental scaffolding for the continuous construction of new musical knowledge.

We should bear in mind that musical forms are the products of composer's mind sets, and that these, being contingent upon contemporary artistic and other values, varied throughout history. It is interesting to note however, that during the time-span that lasted from the late Baroque through the Romantic periods – roughly two hundred years – musical forms varied very little. Composers demonstrated sufficient consistency in the forms of their compositions that theorists could abstract formal prototypes from these compositions. When we speak about musical forms, we actually mean the abstracted prototypes. Thus, when we say sonata form, we don't mean a specific composition but the abstracted form induced from thousands of compositions sharing most of their design characteristics.

Program Development

The development of the program was guided by the realization that musical forms are abstract prototypes of entire classes of compositions. In many instances, composers provided us with the classification of a composition by the title of the work. For instance, a composition with the title *minuet* contains in its title its classification. It provides us with knowledge about its layout design, which changed little throughout history. All minuets basically share the same form. In other instances however, composers provided us with no label to assist us in classifying the composition. In such cases, classification can only be established by analysis.

Selection of the musical examples was based on the following criteria:

- All compositions had to be by composers who lived within the late Baroque and the Romantic periods.
- The forms of these compositions occurred frequently in the music literature of that time-span.
- All musical selections represent generally recognized masterworks.

Once the music was selected, a record company who used existing recordings from their archives placed it on specially produced CDs.

The development of the application program centered on the creation of graphics visualizing the analyses of every musical selection on the CDs. A labeled box represented each element of analysis. As a musical selection was played over the CD-ROM drive, each box would highlight synchronically with the particular segment of music it represented.

An important attribute of the program included its hypermedia interactivity. Users could click on any box and activate instantaneously the music represented by that box. This capability enabled the learner to practice listening for comprehension, experiment with various approaches to learning, and compare different occurrences of similar musical ideas. In addition to this main learning tool, the program also included pertinent historical background information and testing modules. The entire computer program was placed of floppy disks and had to be stored on the hard disk of the student's computer.

Distance Learning

The program was developed for distance learning and provided the complete packaged material for an introduction to music course that has been offered now for over two years at Northeastern University.

Students who enrolled in this course could study "anytime, anywhere." They communicated with the instructor via the course's home page (now replaced by Blackboard). This home page served as the course's main communication vehicle. Students used it to upload their tests to a server and the instructor used it to post periodically quizzes and for general class management. All used it for extensive communication purposes.

As of today, students did not formally evaluate the course. Work on developing a suitable evaluation instrument that can be used over the Internet is ongoing. Informal comments from students however, are decisively positive. A small minority of students experienced difficulties caused be insufficient computer literacy while others missed the classroom interaction.

So far, this course has been offered only to Northeastern University students. This is mainly due to the fact that Northeastern University does not yet offer any of its courses to external students.

MP3 Compression

The original design of *The Anatomy of Music* produced a courseware package that was by necessity static in nature. The music had to be pre-selected and once the CDs were produced, they could not be altered. The attendant application program was linked to these specific CDs, as were the test modules and all the historical background information. Whereas this prepackaged format made the courseware decidedly user-friendly for the students, its static quality limited its usefulness for other instructors. Using this courseware meant to agree with the educational philosophy, methodology, and musical selections that were inseparable from this program. Any changes would require a production of new CDs and the creation of a new application program.

MP3 is a new compression technology that makes it possible to compress large amounts of music data into a relatively small file. Prior to MP3 technology, CD-ROM was the only method available to store and retrieve large quantities of data without requiring inordinate amounts of storage space on the hard disk. Typically, a CD can store about 650 MB of data. This is equivalent to approximately 70 minutes of recorded music. MP3 can compress this data by a factor of 90, or in other words, compress 650 MB into roughly 7 MB. Furthermore, it can do so without reducing significantly the sound quality of the recording.

These smaller music files make it realistic to place them on a server for users to download onto their computers. This has important implications. A courseware designer can now create any number of music files containing separate music examples and rather than have them placed on a CD, store them on a server together with the attendant computer application. These courseware modules would make it possible for any instructor to select only such modules as required. The server would serve as repository for modules that can be continuously expanded with additional modules. Instructors could even request the creation of a particular module. For example, an instructor could ask for a module on "Berlioz's Symphonie fantastique," and, if interested, provide the designer with the desired text files.

Modular distance learning courseware for any academic discipline which requires access to large data files will eliminate the need for static courseware design. Dynamic libraries of course modules, downloadable by students, will make it possible for instructors to create courses completely unique to them, even within similar disciplines and levels.

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Biographical Sketch

David Sonnenschein is an Associate Professor of Music at Northeastern University in Boston. His forty-year career as conductor, educator and composer, is based on experiences gathered in three continents. More recently, he immersed his creativity in the development of multimedia programs for teaching music cognition to the non-music major. His work on the creation of the Internet-facilitated introduction to music course, "Music: A Listening Experience" has won him an international award for Innovative Excellence in Teaching Learning and Technology. In April 1999 this course was featured in the New York Times story about learning and the Internet. Professor Sonnenschein lectures frequently throughout the United States, as well as in Europe and Israel.

Address: 169 Bonad Rd.
Chestnut Hill, MA 02467
E-mail: dsonnens@rcn.com
Phone: (617) 323-3499

Improving the Writing of Business Management Students by Providing an Online Writing Center

Merrily Stover, Ph.D.
Assistant Dean, Communication, Arts and Humanities
University of Maryland University College

Thomas G. Thompson
Academic Director of HR and General Business Programs
University of Maryland University College

Background and Rationale of the Online Writing Center

In Spring 2000 UMUC inaugurated the Online Writing Center (OWC) to assist students in the development of critical thinking skills, understanding of purpose and audience, and the structure, grammar and punctuation in term paper assignments. The OWC was targeted to support the "writing across the curriculum" initiative, one of UMUC's major emphases. The OWC provides student access to online writing guides, interaction with an online writing advisor and self-study modules for the improvement of writing skills. The services are free of charge to UMUC students.

The OWC serves both online students and classroom-based students. UMUC has long faced the problem of how best to serve its student population, which is comprised primarily of adult part-time students. At one point, UMUC provided writing tutorial services for a fee. This underused service was eventually abandoned and students could get writing help from freelance writers at varying fees. Recently, the University of Maryland, College Park's Writing Center has been made available to UMUC local students. However, because distance education students and students in our European and Asian division do not have access to this service, the OWC has been essential to provide full services to all UMUC students.

The Online Writing Center is linked through UMUC's proprietary online instructional platform, WybTycho, so that all online students, in the more than 1000 online classes, may easily access the Center. Many face-to-face classes are now web-enhanced with the result that students in these classes may also access the OWC, and it can also be accessed through UMUC web site.

The UMUC Online Writing Center was recognized by the University Continuing Education Association (UCEA) with the Region II "2000 Award For Excellence."

Operating Philosophy and Procedures

The goal of the Online Writing Center is to help UMUC students develop writing competencies necessary to succeed in the classroom and the workplace. To do this, the OWC offers four levels of services and materials for students. The first is access to the online writing guide and other writing guides. The *UMUC Guide to Writing and Research* is a required text for all courses where another writing guide is not already required. Having the *Guide* online makes the materials easily accessible as a reference for students.

The second level provides writing handouts that students may download. These subjects include how to write a research-based report; managing research materials, documentation guides and citing Web materials, among other topics.

The third level of support is comprised of interactive self-study modules. These self-study modules enable students to test themselves on writing issues. Students may follow the self-study modules at their own speed in their own time. The handouts and the self-study modules are designed with the adult learner in mind, whose writing skills may be "rusty." Topics for self-study modules include plagiarism, and common problems of writing. Others are in development.

The fourth level is one-on-one review of students' writing by Online Writing Center writing advisors. Writing advisors provide answers to quick writing questions as well as feedback on writing drafts. The feedback from the writing advisors is designed to preserve students' ownership of their papers. Advisors give suggestions for improvement in the areas of critical thinking, organization, the mechanics of writing, and they model the editing of brief sections of papers. Students are left with the task of the overall editing and rewriting of their own papers. Writing advisors utilize assessment tools that were developed by an interdisciplinary committee of UMUC faculty and academic directors.

The Online Writing Center is supervised by a PhD. graduate student under the direction of the Director of the Effective Writing Program. The OWC trains and supervises the writing advisors. Writing advisors are graduate students enrolled at the University of Maryland, College Park. The writing advisors handle student papers on weekdays as well as weekends throughout the year. The published turn-around time for review of writing assignments is 48 hours. The in-house goal is 24 hours. Requests for assistance from UMUC to the writing center are reviewed by the supervisor who assigns the papers to writing advisors. After the writing advisors have submitted their suggestions and worked with the student, the supervisor then reviews the work before the papers are returned to the students.

Overall Results

In the year since the Online Writing Center opened, writing advisors have served more than 500 students in improving their writing. Each semester, the number of students has risen substantially as students learn about the service. Advisors answer e-mail questions from students as well as helping directly with student papers. However, 90% of the requests involve exchanges of papers.

Students seeking help with writing assignments have come from a variety of courses across the curriculum, including Behavioral and social Sciences, Business and Management, Computer Applications, Communication Studies, English, Prior Learning, Humanities, Information Systems Management, Paralegal Studies, Psychology, and Technology and Management. The Online Writing Center currently averages about 56 requests for help a day.

The balance of this paper deals with the experience of students from the Business and Management area in testing the effectiveness of the Online Writing Center to improve their writing.

The Business Management Pilot

The Pilot Design

A Management and Organization course was selected because the instructor was a member of the interdisciplinary committee that developed the assessment tools used by the Online Writing Center. The pilot ran in the spring, summer and fall terms, 2000 for different sections of the same course with the same instructor. The term paper accounts for 30% of course grade. Students were offered a 10- point bonus on their term paper grade if they used the OWC, and completed a questionnaire describing their experiences.

This would add 3 percentage points to their total course grade. The cooperating students were also given an extra week to complete and submit their paper.

The Pilot Results

The pilot appears to have been successful. Sixty four of ninety one (70.3%)students, over the three semesters, took advantage of the OWC pilot program. Table 1 below shows the differences in average term paper grades for the users and non-users of the OWC pilot program over the four semesters.

Table 1. Comparison of Grades Between Users and Non-users of the Writing Center.

	Users	Av. Score	Non-users	Av. Score
Spring 2000, Sec. 1	13	91.8	4	85.0
Spring 2000 Sect 2	20	90.0	6	82.5
Summer 2000	12	91.6	6	83.8
Fall 2000	19	91.6	11	84.7
Total	64	91.1	27	84.1

The difference of 7 percentage points (8.3% difference) was relatively consistent across semesters and is significant at the .05 confidence level. The 10-point bonus for pilot participation is not included in these grades.

A copy of the questionnaire administered and a tabulation of results by question are show in Table 2. Tabulations of the questionnaire showed that only 1 of the 64 students was aware of the center before this pilot. Even though the OWC opened in spring, 2000 the summer and fall students did not have an increased awareness. Ninety-two percent (59 of 64) felt the OWC responded in a timely manner. Approximately one-third of the participating students reported receiving significant feedback from the OWC in the clarification of ideas, organization, readability and grammar. Clarification of purpose, strengthened conclusions and citation help was reported by approximately one-fifth of participating students. On the average students reported three categories of useful feedback. Selected quotations from the student assessment of the type and quality of feedback provided:

- Improved sentence structure and consistency of writing style
- Significantly improved readability of paper in addition to providing support with difficult citations
- Clarified structure of paper, moderated use of technical language
- Clearer ideas, stronger arguments, grammar and conclusion
- Reduce wordiness, cut out unneeded sentencesOrganization and use of evidence
- Strengthened topic sentences to help reader better understand
- New set of eyes catches things I miss after reading several times: suggestion to read aloud helps me understand how it will come across to reader
- Gave ideas to add emphasis to the subject

The participants were equally divided in terms of their perception of whether the OWC helped them understand the project and subject matter more completely. The students were unanimous in their willingness to use the Online Writing Center again

Table 2. *Writing Center Questionnaire With Respondent Tabulations*

1. Did you know about center before instructor announced the opportunity to earn extra credit? Yes: 1No: 63

2. Did the writing center respond to you in a timely manner? (within 48 hours)
   Yes: 59 No: 5

   If *no* and there were extenuating circumstances, please describe.

3. Indicate which of the following types of feedback you received from the writing center, and the degree to which you feel it helped you improve your final submission.

   Clarification purpose: 23
   Clarification of ideas/concepts: 35
   Organization of arguments and evidence: 32
   Improved readability and/or clarity of presentation: 36
   Improved grammar and/or punctuation: 33
   Strengthen your conclusion/recommendations: 22
   Assisted with citation protocol: 24

4. Did revising your paper based upon the writing center advisor's feedback help you understand you subject matter more completely?
   Yes: 31 No: 30 No response: 3

   If *yes*, please explain.

5. Would you use the writing center again?
   Yes: 64 No: 0

   If *yes*, with any conditions?

The pilot project instructor looked at average term paper grades for semesters prior to this pilot. The definition of the term paper has been consistent over time. There was a small improvement in the average grade for the sections that used the Online Writing Center, but the assessment rubric(s) used to evaluate the term papers raised the grading standard so that a meaningful comparison is difficult.

Conclusions and Recommendations

The pilot program was successful by any of the metrics used for assessment. Caution should always be used in survey analysis in distinguishing between statistical and causal relationships.
For example when examining the distribution of grades for users and non-users there were several weaker scores that accounted for most of the difference in average scores. The majority of the scores were similar. A plausible conclusion is that weaker students often don't seek help even when it is in their best interest.

An important factor that was highlighted by the questionnaire results is that more effort needs to be expended to inform students of the Online Writing Center. Two corrective actions were taken by placing a link in the options menu for every online course and by promoting the OWC actively in UMUC publications to students.

The administration at UMUC is confident that the Online Writing center contributes to the achievement of the "writing across the curriculum" initiative. The current fifty-two inquiries per semesterday extrapolates to approximately 15,300 inquiries per year; which would represent approximately twenty-five percent of all UMUC students taking advantage of the Online Writing Center each year, if all the inquiries were from different students.

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Biographical Sketches

Merrily Stover is Assistant Dean, Undergraduate Programs, at the University of Maryland University College (UMUC). A leader in distance learning in post secondary education, Dr. Stover's area of purview includes the arts and humanities, amongst other disciplines. Dr. Stover also oversees the design and development of UMUC's award winning Online Writing Center. Dr. Stover has presented numerous papers on distance and online learning to national and international audiences. An Anthropologist by training, Dr. Stover previously taught at the British Open University, Monterey Institute of International Studies, and the University of Hawaii. She currently teaches undergraduate courses online at UMUC.

Address: University of Maryland University College
3501 University Boulevard East
Adelphi, MD 20783
E-mail: mstover@umuc.edu
Phone: (301) 985-7877
Fax: (301) 985-7698

Thomas Thompson, Academic Director of HRM and General Business Programs at University of Maryland University College (UMUC), is responsible for curriculum development and staff hiring for both online and classroom-based business courses. He has been a project manager, an author, and a reviewer for the development of online courses as well as teaching classroom, web-based online, and interactive television courses. His dissertation-in-process on the management of web-based course development won the 2000 William Rainey Harper Research Grant Award.. Mr. Thompson has presented at over a dozen national and regional distance education conferences. Mr. Thompson previously taught at Johns Hopkins University, the Rotterdam School of Management, University of Maryland, Baltimore County, and Villa Julie College.

Address: University of Maryland University College
3501 University Boulevard East
Adelphi, MD 20783
E-mail: tthompson@umuc.edu
Phone: (301) 985-7788
Fax: (301) 985-7021

Faculty Development in the Pedagogical Use of New Technologies: Case HSEBA

Maija Tammelin
Lecturer in English Business Communication
Helsinki School of Economics and Business Administration

Faculty development and training programs are often considered obvious answers when efforts are made to remove barriers to adopting new technologies in higher education. However, such training efforts tend to raise more questions than answers. The main aim of this paper is to explore answers to two such questions that are currently troubling many higher education institutions throughout the world. First, how to motivate teachers in higher education to undertake something that is likely to generate additional pressures and increase their currently heavy workload even further? And second, how to organize training in the use of new technologies for the university faculty in such a way that the training provided would have an impact on teaching and learning and lead to pedagogically relevant changes in educational practices?

In the first part of the paper, I look at the efforts made to integrate new technologies into teaching and learning among higher education faculty. These efforts seem to range from the work of individual enthusiasts to the universities' own initiatives or national strategies (see e.g. Education, Training and Research in the Information Society 1999). It seems however that bottom-up efforts or top-down strategies alone seldom produce the desired results but that as pointed out by Fullan (1999, 19), "Top-down mandates and bottom-up energies need each other".

I then proceed to examine the importance of institutional commitment in connection with launching faculty development programs. In discussing the problems involved in bringing about change, Kerschaw (1996) underlines the slowness of institutional change by pointing out that the transformational process can be expected to take between five and ten years, and that it is easy to slip back to the old ways if the institution begins to lose its focus on change. Furthermore, Switzer (1992) calls the institutional commitment the systems perspective, which he sees as absolutely crucial if change is to be successful. For full implementation to occur, all component parts of the system must be in place. As an example of a failure to structure component parts of the system to empower for change, he wonders how many universities have purchased large amounts of technology for faculty use but have provided virtually no staff development in the use of this technology.

In conclusion of the first part of my paper, I analyze the reasons for the low level of enthusiasm among the mainstream teaching faculty for educational innovations in general and for new technologies in particular, by using the technology adoption life cycle studies as the sounding board (e.g. Moore 1991; Geoghegan 1994; Jennings & Dirksen 1997; Thompson 1999; Johnston 1999; Garrison & Anderson 2000).

Faculty Development as a Strategic Choice: Case HSEBA

In the second part of my paper I present a case study from a Finnish university, which exemplifies the process of implementing educational change through faculty development and training. As most of the problems encountered during such a process are not specific to one particular institution or country, many of the points made are therefore applicable to other universities in other countries as well.

The Helsinki School of Economics and Business Administration (HSEBA) is the leading business school in Finland with an enrollment of some 3 500 students in its Bachelor's, Master's, doctoral and MBA programs. Its five departments for research and teaching include the departments of Accounting & Finance, Management, Marketing, Economics, and Languages & Business Communication. With all of its buildings recently renovated, the School houses an excellent technical infrastructure. Still, the overall development in the pedagogical integration of new technologies (for instance e-mail, computer conferencing, video conferencing and the web-based applications) into teaching has been slow and has lacked the pedagogical added value in many cases.

In 1998, one of the School's departments took a step, which turned out to be crucial not only from the Department's own perspective but also because it has had an impact within the whole School. The Department of Languages and Business Communication, chosen as one of the national Centers for Excellence in Teaching among Finnish university departments for the years 1998-2000 and 2001-2003, underwent a critical self-analysis as to where it stood as far implementing new technologies in teaching and learning was concerned. As a result, it turned out that although a handful of enthusiasts had been carrying out various successful technology enhanced projects all through the 1990s, it seemed that the situation within the department resembled closely the one outlined by a national evaluation report regarding the pedagogical use of ICTs (=information and communication technologies) in the Finnish educational institutions: there seemed to be a significant gap between the early adopters and the mainstream faculty (Sinko & Lehtinen, 1999).

As a result of the department's critical self-analysis, concrete measures were taken. In order to involve all faculty members in developing their media skills and ICT competencies, the development of network-based environments was added into the departmental strategy as one of the department's strategic focus areas. Two specific aims were set: first, every faculty member was to have sufficient skills in the use of ICT by the end of the year 2000, and second, all 35 teaching faculty members of the department are to have a sufficient pedagogical understanding of network-based language and business communication teaching by the end of the year 2001. These undoubtedly daunting challenges were responded to by launching two specific training programs: "Media Passport" and "Media Education & ICT in the Teacher's Work" faculty development program (see Tammelin, 2000).

The Media Passport program consists of problem-based sessions during which the voluntary participants are given hands-on practice in the use of such software and equipment that is relevant from the perspective of their own work. The second much more extensive program, "Media Education & ICT in the Teacher's Work" faculty development program, was tailored for the Department jointly with the Media Education Center of the University of Helsinki, which also provided the trainers for the program. This eight-month-long program has now been run twice. In the first program all 16 participants represented language and business communication teaching. During the second program half of the participants came from the HSEBA's other departments or units, which were the Department of Marketing, the MBA program and the SME Center.

After a more detailed examination of the two programs, this paper proceeds to a critical evaluation of these training two endeavors and sets out to identify criteria for successful faculty development programs. Among these criteria are the following:

- Community building
- Commitment
- Experiential learning

- Sufficient length of the training program
- Combining theory and practice
- Multiple perspectives
- Concrete relevance to one's own work
- Availability of constant technical support

The paper concludes by summarizing the perspectives emerging from the case described in this paper. The two main perspectives are closely in line with those presented by Robinson (1998). First, the perspective of strategic choice focuses on increasing expertise within the organization on the whole. The second perspective is that of the professional development of individual participants, drawing on the assumption that training can only lead to permanent individual changes if it is carried out as a collaborative ongoing project that provides sufficient opportunities for discussion and critical reflection

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Biographical Sketch

Maija Tammelin is a Lecturer in English Business Communication at the Helsinki School of Economics and Business Administration (HSEBA). She is also in charge of faculty development programs in the use of new technologies in the HSEBA's Department of Languages and Business Communication. She is a member of the EUROCALL Executive Committee and the Academic Advisory Panel of the ReCALL journal. Her current research centers on teacher & learner roles and social presence in online environments.

Address: Runeberginkatu 14-16
POB 1210, 00101
Helsinki, Finland
E-mail: tammelin@hkkk.fi
URL: http://www.hkkk.fi/~tammelin/
Phone: +358-9-43138345
Fax: +358-9-43138627

Managing Distance Education:
Issues Behind Online Classes

Charalambos Vrasidas, Ph.D.
Assistant Director for Distance Learning
Center for the Application of Information Technologies
Western Illinois University

Richard Chamberlain
Associate Director
Center for the Application of Information Technologies
Western Illinois University

Rapid developments in telecommunication technologies have made life-long learning a practical reality. Virtual high schools, virtual universities, and online degree programs are growing at a fast rate. Instructors are asked, and often required, to develop online classes. Designing an online class is often regarded as an easy task. Administrators and instructors in higher education institutions and K12 schools often fail to understand the complexities behind online classes. The purpose of this paper is to provide an overview of the issues behind the design, development, implementation, and management of online classes.

In the next few pages we will briefly describe an online class, discuss the infrastructure behind it, present the process we followed while developing the class, and discuss issues as they relate to the design, delivery, and evaluation of the class. The issues we will cover will be of particular interest to those planning to develop online classes or those currently developing online classes. Practical, political, and theoretical issues will be discussed as they relate to online course development.

Description of the Class

The class was on consumer education and it was developed by the Center for the Application of Information Technologies (CAIT) for high school students served by the Large Unified District Association in the state of Illinois. The emphasis of this paper will be on the process we followed while working on this project and the lessons we learned.

Managing the Design and Development

The production team of the class consisted of a project manager, the three teachers who were assigned to develop the content, two instructional designers, a graphics artist, a web developer, and a database programmer. During the three initial meetings with all stakeholders (school district superintendents, teachers, and principals, CAIT staff), several critical issues were discussed. Two of the issues that were discussed thoroughly were: (a) how to select students that will be allowed to enroll in the online class, and (b) how to ensure that all students will have access to the technology needed to complete the course. To ensure access to technology, school districts decided to make available computer labs, libraries and study centers, so that students could attend and complete the class. Since this class was a pilot project, we decided for student selection to establish the following criteria: (1) students must first indicate that they want to take the online class, (2) students should receive a recommendation letter from their school counselor verifying that the student is self-motivated, able to meet deadlines, has basic computer skills, and possesses solid reading and writing skills, and (3) the student's parent(s) should agree to their child taking the online class.

Following the initial meetings, the production team at CAIT established a timeline for the project. Before plotting out the timeline we held several meetings with the teachers who were assigned to develop the content, and the coordinators of our departments of web development, database development, and graphics design. Since this class was to be developed from "scratch," without using a course management tool (e.g. Blackboard, or WEBCT), it was estimated that it would take at least 5 months for development.

This online class was just one project among the tens of other projects that were under development at CAIT. One of the most difficult tasks we had to deal was establishing a timeline to accommodate the busy schedule of our content experts who were teachers with full time jobs. Teachers were not being paid extra to develop this class. Therefore, as production coordinators, we could not be too demanding on the timely delivery of content, something that became a serious issue at the end. Two weeks before the class was launched we were still receiving content revisions, which created serious complications for the production team. When developing complex database driven interactions, any revisions that might require the reorganization of the database structure can be very complicated and time consuming. Unfortunately, because of delays and constant revisions of the content, we faced this hurdle several times, and at critical moments of the project.

Another issue that we had to deal with was working with three teachers (content experts) from three different school districts, who never taught online. First, we had to help these teachers understand the capabilities and limitations of the online environment. Then, we had to maintain a common voice throughout all the units that each of the teachers developed. After all content was submitted to us, we asked one of the teachers to review all the lessons and revise where necessary in order to build a thematic unity and maintain a degree of common voice throughout the lessons.

Consumer Education online was offered for the first time during the summer of 2001 by three school districts. The three school districts which participated in the development of the class had three different summer time schedules for offering the class. Therefore, while developing the class we had to develop it in a way to accommodate the different time schedules of the schools that would offer the class. In addition, we had to consider the fact that during the fall, the class is offered over a period of sixteen weeks. So, while developing, we had to structure the course in a way that teachers could choose the components they wanted to cover for the summer, and yet be able to offer the class in the fall with minor modifications.

We have designed and developed numerous online classes at the undergraduate and graduate level. This was one of the first online classes we designed for the high school level, and we were trying to accommodate the special characteristics of high school students. One of the structuring issues we agreed on was that we wanted to control the access the students had to content. Since lessons and units were building on each other, we created a database driven site that allowed students to proceed to unit 2, only if they have completed unit 1. In addition, we allowed students to progress at the their own pace. So, a student could complete all the work in five instead of six weeks. This, however, posed some limitations to our ability to structure more collaborative activities for the students, other than the simple discussion questions they had to respond to.

For all online classes that we develop at CAIT, we have established a process that we follow and which has streamlined the development of online classes. One of the lessons we learned from online course development is that communication among all parties involved in the development process is of great importance. Regular meetings, memos distributed via email, and weekly reviews of the status of the project were very helpful in keeping everybody on track and informed on the stage of the project. We found particularly helpful the development of a template to coordinate the efforts among teachers, instructional designers, and web developers. Furthermore, the template streamlined the process of preparing content for the class. This template consisted of a simple word document that included the major headings and conventions the content experts should use to assist the web developers format their content.

One of the major constraints we had to deal with was time. We began working on this project at the end of January, which proved to be a very limited time frame. Working with three teachers, coordinating content delivery, web development, server maintenance, database development, teacher training — all in five months — was not enough time. It would have been much easier had we decided to use a commercial course development and management tool like Blackboard or WebCT. These tools provide already developed authentication systems, discussion boards, digital gradebooks, and student report and communication mechanisms. Having to develop all these features from scratch proved to be a logistical nightmare given the limited time we had. We received the last pieces of content at the middle of May, which allowed us only two weeks to test and revise the technology delivery component of the class.

Managing the Delivery of the Course

One of our goals was to provide training to the teachers on how to use the tools we developed and how to be effective online teachers. We prepared a 2-day workshop during which we worked closely with the teachers to help them prepare for teaching online. During the workshops, we tried to model to them the first day orientation, which they planned on having face-to-face with their students. We prepared a student manual, which we demonstrated and explained during the workshop. Then, we guided them through the lessons and activities of the first unit. Teachers practiced using the course's website, submitting activities, participating in discussions, writing journals, and using the tools of the site such as the help, glossary, and communications area.

After completing unit 1, we moved to the teachers site, which was the section of the website that only teachers could access. There, the teacher can create a class, add and delete students, assign user names and passwords, edit the personal information of each student, and access the class gradebook. From the gradebook, the teacher can access all activities that the student completed, review them and grade them. This part of the website teachers found very helpful since it made grading and monitoring student progress very easy. We helped teachers enroll some of their students and practice grading some sample activities.

The next part of the teacher training dealt with strategies of effective online teaching. We first presented an overview of distance education and its major theoretical constructs. Then we discussed general findings from research on the characteristics of effective online teaching. Finally, we presented and discussed a set of strategies on how to be an effective online teacher, take advantage of the medium and structure cooperative activities. We addressed issues such as the importance of providing prompt and specific feedback to students, how to moderate online discussions, how to deal with inappropriate online behavior, and how to encourage participation in an online class.

Managing the Evaluation of the Course

The evaluation for this project was of a formative nature. The major goal was to improve the class and identify some lessons we could use for the development of subsequent online courses. The senior instructional designer for this project served as the evaluator of the project and he was keeping notes and reflective journals on the process and all the meetings with the stakeholders. In addition, project documentation, the web-site's access statistics, student journals, student assignments, teacher journals, interviews with students and teachers, are all data that will be used for the evaluation. Usability testing with high school students was also conducted that helped us revise and improve the interface and navigation structure of the course's web site.

Conclusion

Managing the design, development, implementation, and evaluation of online classes is a complex process. One of the most important lessons we learned is that open dialogue, communication, and coordination of efforts among stakeholders is an important component of successful project completion. Establishing clear time frames and meeting deadlines when working with individuals new in the environment is difficult, but yet very important for developing online classes. Sharing lessons and experiences from the process and reflecting on one's practice can be beneficial for the developers and those interested in online course development.

Biographical Sketch

Charalambos Vrasidas is Assistant Director for Distance Learning and Coordinator of Research and Evaluation at the Center for the Application of Information Technologies at Western Illinois University. He has been involved in distance education for the last 10 years. He has conducted research in the areas of distance education, online learning environments, and technology integration. He is currently evaluating virtual high school projects and online professional development programs funded by the U.S. Department of Education. Links to these projects can be found at http://www.cait.org/vrasidas

Address: 101 Horrabin Hall
Macomb, Illinois 61455
E-mail: vrasidas@cait.org
URL: http://www.cait.org/vrasidas/
Phone: (309) 298-1804
Fax: (309) 298-2806

Richard Chamberlain is Associate Director of the Center for the Application of Information Technologies at Western Illinois University. He has been involved in multimedia development and distance education for the last 15 years. He has given numerous presentations and workshops at national and international conferences.

Address: 101 Horrabin Hall
Macomb, Illinois 61455
E-mail: RChamberlain@cait.org
URL: http://www.cait.org/
Phone: (309) 298-1804
Fax: (309) 298-2806

Interactive Course Content for Teaching Mathematics Via Distance Learning Media

Charles B. Wakefield
Assistant Professor of Mathematics
The University of Texas of the Permian Basin

Interactivity

Many investigators have established that interaction between the learner and the instructor is an important component in the learning process. A recent article (Parker, 1999) gives an excellent overview and an extensive bibliography on this subject and web based courses are uniquely able to meet the interactive components that Parker suggests. The article cited above provides sound justification for the interaction in the pedagogical processes. Higher levels of motivation, higher academic recall, and a more positive attitude toward the course, are all by-products of different types of interaction. Cognitive speed studies also imply a strong urgency for interaction in the learning process (Schaffer & Hannafin, 1993). Integration of interactivity into the course content of the web-based course profoundly increases the potential for both the enjoyment of learning and the enhancement of cognitive skills (Summers, 1991). For these reasons it is necessary to design course content that engages the learner in interactive activities (Carlson, 2000, Sherry, 1995). There are several studies that provide evidence that student-content interactivity may be the missing link in distance education learning (Shaffer and Hannafin, 1993; Romiszowski, 1998).

Interactivity in the Traditional Classroom

Consider how we might improve the time-proven instructional methods of the past. In our attempt to design and deliver distance education, we should look at the methods, strategies, and techniques used in the traditional classroom and try not to simply copy them, but we must try to extend, expand, and improve them. In a web-based course, we are no longer constrained by a 50-minute class period. In the traditional class setting there has always been open interactivity between the students and the instructor. Also there has been the opportunity for the students to visit with each other and exchange viewpoints pertaining to a particular lecture topic. Many classes have tutorial sessions where the interactivity occurs between a tutor and the students.

Interactivity in a Web-Based Course

A desktop computer linked to the Internet provides a unique vehicle that can be utilized to capture, amplify, and even exploit most of the successful teaching strategies used in the traditional classroom. Student-student interactivity can take place via email, phone, actual contact, or the conference board. Student teacher interaction can occur via email the phone, or the web board, or actual contact. However content is the backbone of the web-based course. The content must come alive for the web-based course to be an effective teaching tool. So our focus is the interactivity that can give life to the web-based course.

Explanatory text of a web-based course is similar to the spoken lecture of the traditional course. In the traditional class the student hears the lecture. In the web course the student must read the lecture. Web-based text should amplify, clarify, and extend the important ideas and concepts of the course. The text must be organized and clear. Writing the explanatory text in a conversational tone rather than a formal tone may be more "user friendly," depending on the audience. Know the audience. This is the key to understanding how much detail to include. However, it is better to have too much detail than too little. The fast learner can scroll through the material rapidly while the slower student might really appreciate the detail and the opportunity to review the information at a pace more conducive to his or her individual needs. The idea of "Overwhelming the Concept" by exploiting several different types of student-content interactivity is easily done within a web-based course but is difficult in the traditional class due to time constraints. Effective explanatory text will have several different types of interactivity embedded in it. These types of interactivity will be addressed shortly.

Explanatory graphics labeled and clearly defined when placed in the text of a web-based course take the place of figures in a textbook or pictures drawn on the chalkboard in the traditional class. Often, labeled graphics embedded in explanatory text can be very effective in clarifying concepts. These graphics can be generated in any of the popular Computer Algebra Systems, converted to the appropriate format, for instance gif or jpeg, and exported to the web. *Mathematica*, by Wolfram Research, Inc. Wolfram (1999), is an example of one computer algebra system that can be used to generate about any mathematical graphic needed.

A traditional class may use a video to illustrate a point with an animation, but this is time consuming and requires set-up time. Animations in a web-based course are simple to set up and are powerful teaching tools that can be used to drive home the essence of a concept. Animations on the Web use the computer as a tool to facilitate the mind's attempt to visualize a concept. Because they can be designed to stop or start with the mouse, they are two-way interactive with the learner. In management science, animations have been used to illustrate the discovery of Euler circuits, Hamiltonian circuits, minimum cost spanning trees, and the corner point principle involved in the graphical approach to linear programming. In the first three of these examples a student might consider the rules and attempt to mentally design the circuit. The animation showing each step of the development supports this mental process. Animations are another tool that can be used to "overwhelm a concept" so that the slowest learner or the most ill prepared learner can master a concept. The informed or fast student can scroll through these animated examples at warp speed and move on to more challenging parts of the web-based course. It is very difficult and always a challenge to teach to the slowest and the fastest or more informed student simultaneously in the traditional classroom. However, with well-developed student-content interactive web based courses it can be done far more efficiently.

Well-designed student-interactive practice quizzes, which do not count toward the student's grade, can be placed periodically in the web-based course text. They give instant feedback to the student. The results of these practice quizzes will encourage the student to go on to the mastery test, which does count on the student's grade, or if necessary, back up and work through some of the course a second time. This type of interaction is possible in a traditional course, but the time constraint can be a problem. In this section it is also possible to ask some questions that will extend the concepts being taught to more advanced ideas. This provides an excellent vehicle to increase the student's understanding without lowering his or her grade. Most of the questions on these practice tests should be similar to the ones that will be used on the mastery test.

In the traditional class, the instructor can give handouts, references, and URL addresses. The student can look these up after class. In a web-based course the student can, with the click of a mouse, bring up the pertinent information while the content of the course is still fresh. The Internet is a treasure trove of information the web-based course can access, but the conventional classroom is isolated from this vast resource.

Experimental student-content interaction can be compared to a two-way discussion between the instructor and the student in the traditional class. These types of interactions are the primary focus of our presentation. The instructor might ask the student to carry out some activity such as perform a calculation, plot a graph, solve an equation, or any mathematical operation during the class. Text in a web-based course could request a similar activity. This activity could be placed within the explanatory text of the web-based course. In a web-based course the learner might on his or her own initiative decide to carry out some type of experimental activity. This usually does not occur in the traditional class because of the time factor and the need to pay attention to the lecture. Because the student is using a desktop computer, the web-based text could ask the student for a rather lengthy complicated calculation which could never be done in the traditional classroom setting. Activities like this are available now.

We have developed about 20 different interactive sites. They are integrated into the html code and trigger action in the computational engine of a computer algebra system loaded into the server. The computation occurs in the server and the results are down loaded to the student's computer. Statistical functions such as linear regression, contour plots, limits, differentiation, and numerical solutions of a system of differential equations along with a plot of the solution of each equation in a single plot have been done. Essentially any mathematical operation needed to highlight or illustrate a concept in Calculus can be programmed and integrated into the html code for a web page with very little difficulty. We have one site that gives a three dimensional graphic which can be repositioned using the mouse pointer so that the graphic can be seen from any perspective. Student-content interactivities like this one are extremely effective (Schaaffer & Hannafin, 1993, Summers, 1991) in teaching concepts in mathematics, science, engineering, economics, statistics, etc. We have a site that will do several statistical operations such as regression, correlation factors, standard deviation, etc. Another site will give the numerical solution to a system of non-linear differential equations and show a single graphic of each of the solutions color-coded over the domain of interest.

These different highly interactive sites are "raw sites" in that they can be integrated with the text needed to define the subject discipline. For example it is often necessary to do integrations in Physics or Physical Chemistry. For these disciplines we would simply need to wrap the integration site with the text explaining the concept in Physics or Physical chemistry to use the integration site in these subject areas. We can develop sites to accommodate many different mathematics courses. The statistical sites can be used in sociology, Physiology and other subject disciplines where statistic is an important tool.

It would be very difficult to require a student to perform the types of computations or plots mentioned above during a traditional class without each student having a computer available at his or her desk in the classroom. Even then time would most likely create a problem in a regular 50-minute lecture. Not only can the three-dimensional surface be examined from any perspective, but also the function plotted may be changed and the new function plotted in only a second or so. Students are able to use this highly interactive ability to investigate and explore on their own. This ability clearly opens a window for students to discover knowledge. Practice quizzes can be done and then checked using the interactive functions.

What experimental executable functions would be necessary for a web-based course? The list would vary depending on the course being considered. Because some of the software needed to develop these interactive sites is not yet released, I can't give the URL's in this paper. UTPB is a test site for this software package. It should be released soon.

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Biographical Sketch

Dr. Charles B. Wakefield, is Assistant Professor Mathematics, His education includes a Ph.D. in Chemical Physics (UT Austin), a MS in Physical Chemistry (University of Washington Seattle), a BA in Mathematics, plus 18 hours of graduate credit and a BS in Chemistry. He has been interested in integrating technology into the classroom for the past 7 years and has successfully used *Mathematica* in the teaching of Physical Chemistry, Physics, and many of the sophomore, junior, and freshman level mathematics courses. Having designed, deployed, and taught (for the fifth time this semester) a web course in contemporary mathematics that was awarded The Commitment to Excellence Faculty Award by the University of Texas in Austin TeleCampus (May 18, 2000), he has gained some experience in working with distance education courses. Dr. Wakefield also has taught Calculus III several times through a compressed video system to his own students plus students at several of the surrounding community colleges. Over the past several years, he has given distance-learning presentations at several different conferences.

Address: 4901 East University Boulevard
Odessa, TX 79701-0001
E-mail: Wakefield_C@UTPB.edu
Phone: (915) 552 2259
Fax: (915) 552 3230

Team-Teaching and Team-Learning on a Global Scale: Insiders' Account of a Successful Experiment

Vlad Wielbut
Computer Systems Consultant
University of Michigan School of Information

Debasish Dutta
Professor
University of Michigan College of Engineering

After months of preparations and multiple travels between Ann Arbor (USA), Delft (The Netherlands), and Seoul (South Korea), the course "Global Product Realization" was launched in September 2000 and concluded 3.5 months later, in December. This course, first of its kind at any of the participating institutions, and probably one of only very few of its kind in the world, proved that it is possible for professors in three different countries to team-teach a group of students located in three very distant places, and make it feel as if it were all happening in a single classroom. (It proved other things as well, but we'll point those out later in this article.) Speaking from a still very fresh perspective, it was a success on many levels:

- technological: with various sophisticated technologies working fairly seamlessly together, without major failures
- educational: with students producing interesting ideas and models, largely on time, despite the challenge of working in a new environment of multinational, virtual teams
- logistical: with skillful navigation through different educational calendars, different sets of requirements, and varying levels of technical support
- perceptual: with a great majority of students considering participation in this course a highly valuable experience and willing to take more courses like this in the future

While industry has been forced to deal with globalization issues since the early 1990s, product development for global markets is a new topic gaining attention in the academic world. This course is our first attempt to focus on the topic in a classroom setting. Needless to say the content and format are still evolving. However, collaborative engineering accross time zones and geographic regions lies at the core of this new area and provided the motivation for us to create a new (virtual) global classroom.

Preparations

Preparations were kicked off in late Fall 1999, with a meeting to consider, in very practical terms, the idea of an educational experiment involving engineering departments at the University of Michigan, Technical University of Delft, and Seoul National University. The idea was this: three professors from the three universities wanted to offer a graduate-level course in which students would learn how to design products for a global market, and where the learning itself would happen in a global environment. The question that the meeting was to answer was: Is it possible, with today's technology but without NASA's budget, to connect these three professors and their students within a single, "virtual" classroom, without losing any of the benefits of a "physical" classroom: spontaneity, eye contact, rich interactions, visual cues, etc.

The answer to that question was a cautious "yes." Cautious, because it was quite clear that some kind of video communication will be necessary, and our experience in this area was limited; we had only a vague idea of the costs involved or of the technical hurdles we would have to jump over. Not to mention some serious, long-standing misgivings about the value of video communication in online learning and collaboration.

The room where the course would take place (on the US side) was already equipped with a several-years-old system from PictureTel, but it quickly became clear that in order to use it, we would have to acquire services of a commercial company to bridge (connect) our three sites. The cost of such a service, at around $30/minute would make this prohibitively expensive. Given that the other 2 sites did not yet have videoconferencing systems in place, we saw this as an opportunity to upgrade our own equipment with technology that would not became obsolete overnight. Hence, in the following couple of weeks we evaluated a number of videoconferencing solutions, to finally settle on Polycom's Viewstation MP.

With this out of the way, the decision as to the type of connectivity (IP or ISDN) had to be made. Some of us were leaning toward IP, believing ISDN to be a technology on the way out, and way too costly for what it was capable of delivering. Unfortunately, Polycom MP does not bridge IP connections, so a third-party was still needed. Through sheer accident we found out about an ongoing experiment in distance education via IP videoconferencing between three universities in the United States and promptly contacted the people running this experiment. It turned out that a consortium of American universities purchased a sophisticated bridging equipment, now located at Ohio State University, for the members of the consortium (including the University of Michigan) to make use of at no cost. It was just a matter of giving the equipment's operator IP addresses of all the sites to be connected.

Network throughput between Seoul, Delft, and Ann Arbor was tested, with results ranging from inconclusive to good. Alas, the fear of instability and bandwidth fluctuations in the public Internet prevailed, and the decision was made to play it safe and rely on ISDN connectivity instead. (There was also concern, that we would suck up too much bandwidth from our respective university networks, in effect slowing them down or disrupting their operations.) In retrospect it probably was a smart choice, which rewarded us with problem free connections for most of the sessions. However, we still hope to run a course like that via the Internet soon, to prove that it is, indeed, a very capable medium.

The Virtual Classroom

Obviously, videoconferencing was not the only technological challenge we faced. Besides seeing their professors and colleagues, the students would have to receive and submit assignments, work in distributed teams, communicate frequently outside the teleconferencing room, access course materials, etc. Blackboard CourseInfo was selected to provide the "virtual classroom" for the course, partly because our Delft partners already had the server up and running, but partly because it is, indeed, one of the best tools in its category. In this very easy to use package of seamlessly integrated components students and instructors would find: discussion boards, e-mail system, bulletin board (announcements), space for course materials, personalized Web pages, directory of participants, whiteboard (with collaborative browsing capability), chat rooms, and more.

While Polycom supports an impressive list of input sources (microphones, video cameras, VCRs, document cameras, computers), which in turn enables sharing almost any type of material, including PowerPoint slides, only one source can be active at any given time. When images from a computer are being sent, live video is not, and vice versa. Since lectures with visuals were to be a main part of every class session, videoconferencing would be reduced to sending static images and speaker's voice to participating sites. This was clearly unacceptable. Therefore, Placeware Conference Center (provided by ACT) was to supplement videoconferencing with its slideshow capabilities. Placeware, a Web-based conferencing tool, would allow three sites to synchronize the PowerPoint slides during a lecture, freeing the Viewstation to serve its primary purpose, i.e. send and receive live video and audio. Placeware itself would be projected independently but in parallel with the videoconferencing.

Since each school had a variety of CAD systems for its students to use, there was a need to establish a collaborative CAD environment. With a view towards ease of use a suggestion was made to offer students access to eVis, a fairly sophisticated tool that would allow them to collaboratively view and manipulate 3D objects (from CAD applications) in real time, over standard Internet connections. eVis is provided through the ASP model, so no investment in hardware and server software was needed—all that was required was purchasing appropriate number of relatively expensive user licenses from the provider, and installing client software on multiple machines at participating institutions. Admittedly, this was somewhat risky proposition, as it brought the number of various technologies to be used in the course to the point of oversaturation. Although we have no hard data to support this assertion, there is anecdotal evidence suggesting that introduction of more than 3 distinct technologies in a course (online conferencing, discussion boards, document sharing) is more a detriment than help, and will result in less effective use of these technologies. A course overloaded with tools runs the risk of becoming a course *about* these tools, regardless of what the initial theme might be.

The Course

Forty-eight students, 16 at each of the participating schools, took this experimental course in the Fall semester 2000 (September-December). All were graduate students, but from various disciplines. The intent was to form cross-disciplinary teams for the project. The students in this class came from mechanical enginnering, manufacturing engineering, industrial design, and MBAs from the business school. The topic of the course was: "Global Product Realization," with the stated objective of providing the students with the experience in:

- Applying engineering principles to solve an open-ended global product design and manufacturing problem (developed by the faculty in consultation with industry);
- Working as an international team using the worldwide network on a globalized engineering design and manufacturing problem;
- Providing a practical solution to the globalized problem keeping in mind performance, safety, cost, environment considerations as well as the each country's constraints such as tariff, law, marketing characteristics and so on.

The course's schedule called for two ninety-minutes lecture sessions each week, with two midterm project reviews, final project presentation, and final exam (Delft students only). Lecture sessions were held in designated rooms on the 3 campuses, each room equipped with a Polycom Viewstation unit, a monitor or a display for the Viewstation, projector and screen. The format of the lectures was standard: a speaker in front of the classroom (many of those speakers were invited experts from the industry or from other departments) and a set of PowerPoint slides. Each lecture was followed by a brief discussion, during which students from all three locations would ask questions of the presenter or offer comments on the subject. The lectures - voice and slides but not video - were recorded using Placeware's recording capability and published on a Web site right after each session, for on-demand playback.

In this course we adopted a case-study approach to teaching (a format common in business schools). Several case studies were developed by the faculty in cooperation with companies like Ford Motor Co., Samsung, Philips, Steelcase, etc. Each case desribed the development of a product that was to be marketed in different regions of the world. In varying depths, each case highlighted new issues that product development teams in these companies had to consider. These issues included patent law differences in various parts of the world, product liability considerations in global markets, product pricing and supply chain management for global firms, trade and tariffs, etc. In addition, importance of product centric topics such as DFE, DFM, material selection, QFD, etc., were also reiterated in the case studies. Finally, the importance of team work, collaboration across timezones and cultural differences were highlighted by almost every case study.

After the first session students were divided into 8 teams, with 6 members each, 2 from each country. The teams were to collaboratively develop a prototype of a coffee maker that could be marketed in three countries (Holland, S. Korea, and USA) with minimal or no modifications. Besides designing a 3D model of such an appliance in a CAD system, the teams were also responsible for: researching patents that might be involved in the proposed product; choosing the best location for the manufacturing plant (considering the costs of materials and labor, shipping costs, existing infrastructure, etc.); researching cultural preferences in coffee consumption; estimating the size of potential market, etc. A really complex project that, given the relatively short span of available time, required frequent and efficient communication within teams.

Recognizing the importance of communication, the teams were offered the opportunity to sign up for 30-minute videoconferencing sessions held before and after each lecture throughout the semester. Due to the high cost of videoconferencing, the initial idea was to offer this only for one or two introductory, "getting to know each other" sessions, but it quickly became apparent that students considered this an important tool for communication. However, these sessions were not sufficient and the teams relied heavily on textual chat and asynchronous discussion boards, both available within the Blackboard environment. We hoped that students would use eVis for real-time discussions of their CAD models, but they found it easier to work with drawings and diagrams which they exchanged as image files via Blackboard, reaching for CAD systems only shortly before the final presentation.

Course Evaluation

After the course had ended, we asked the students to take part in anonymous, online survey composed of 20-questions aimed at extracting their opinions about the course. Several surprises awaited us when the results of the survey poured in. One was the response rate: of the 48 students in the course, 36 (75 percent) filled out the questionnaire, despite having no incentive for doing so. Another one was the fact that 81% of respondents stated that the global team approach—which must have posed significant challenges for the students—"added tremendous value to the course." Yet another one was the overwhelmingly good opinion students had about the course and its novel format:

- 81% of respondents would participate in a similar course (6% would not, 13% wasn't sure)
- All but one would recommended this course (as it is) to a friend
- None of the respondents participated in a distance education course before, and 44% had no idea of the potentially demanding nature of such a course (36% did have an inkling), yet 86% would still enroll in it.
- Most lectures given in the course were considered useful by 64% of students. All lectures were deemed useful by 8%, while the remaining 28% perceived only some lectures as useful.

These positive opinions are all the more satisfying that the course required more than average effort: 56% admitted that they had to spend much more time studying for this course than for others, while 31% had to work a little harder than usual. This effort apparently wasn't wasted: *all* students claimed that the course changed the way they saw themselves and/or the world afterwards.

Somewhat surprising was also how the various technologies were rated by the respondents: 64% rated videoconferencing as "very useful," 25% as "somewhat useful," and 11% as "not very useful." (This seems contrary to the widely held opinion of live video as unnecessary frill that adds little value to communication). Blackboard was considered "very useful" by 83% of respondents; no surprises here—this is, indeed, a well designed virtual classroom environment. Placeware fared less well: the same number of people (17%) considered it very useful and not very useful, while to 42% it was somewhat useful and 22% didn't have an opinion. This was also hardly surprising, considering that Placeware was used in a rather limited fashion in this course and that students did not have opportunities to interact directly with this tool. eVis received very negative ratings and its inclusion in future iterations of the course will likely be re-evaluated: 36% viewed it as not very useful, 33% did not have an opinion, and 17% complained that it was "more a problem than help."

Closure

We were very gratified to receive the positive evaluation from the students. For all faculty and staff involved in the course it was an enriching experience. So much so, that at the time of this writing we have begun planning for the next offering of this course in Fall 2001. Some changes are being planned in the content, structure, and delivery, with a view towards improving student experiences and enhancing the collaborative environment.

Biographical Sketches

Vlad Wielbut is the Computer Systems Consultant at the University of Michigan School of Information and the Community Technology Specialist at the Alliance for Community Technology.

Address: 2184 Media Union
2281 Bonisteel Blvd.
Ann Arbor, MI 48109
E-mail: wlodek@umich.edu
Phone: (734) 647 –8038

Debasish Dutta is the Professor of Mechanical Engineering and the Director of Interdisciplinary Professional Programs at the University of Michigan College of Engineering.

Address: 2276 G. G. Brown / 2125
Ann Arbor, MI 48109
E-mail: dutta@umich.edu
Phone: (734) 936-3567

The IEEE Professional Development Institute: Linking Members to Web-Based Education

Peter Wiesner
Director of Continuing Education
IEEE Educational Activities

Engineers and computer scientists have taken center stage in the development of the Web for research, commerce, and education. But when it comes to applications related to their own professional development, "the shoemakers' kids have no shoes" syndrome applies. There are plenty of online courses and tutorials for certified technical training through commercial providers, such as Microsoft, but few such opportunities for "hard core" engineering. Several universities have begun to offer graduate engineering degree programs online as well as some non-credit short courses. But, engineering associations are only now beginning to take advantage of web delivery of education, concentrating most of their efforts on electronic publications via CD-ROM and more recently via the Web.

To meet the challenges and opportunities afforded by the Web, the IEEE started The IEEE Professional Development Institute (IEEE PDI) to support experimentation in the use of the Web for online courses. PDI has developed into a clearinghouse of information and resources, including conventional and online graduate and short courses. Launched during 2001, the IEEE PDI site <www.ieee.org/pdi/> links engineers with learning resources from the IEEE, universities and commercial providers. This site also provides overview materials as a service to IEEE members and customers. One IEEE PDI challenge is the development of career "maps" useful for gap analysis and locating appropriate resources.

The development of IEEE PDI dovetails with the NSF-funded DLNET Project headed by Virginia Tech. In which IEEE, ASEE and Iowa State are co-PI's. This project focuses on bringing lifelong engineering education into digital libraries, and addresses issues such as pedagogy for online instruction as well as methodologies for collecting learning objects.

What Do IEEE Members and Customers Want?

IEEE has been involved in distance education for quite some time, starting with videos, self-study courses, and satellite broadcasts. After eleven years of operations, the satellite program was canceled when it was found that users taped the broadcasts instead of taking advantage of its "live" features. IEEE continued to mail out videos and largely print-based self-study courses. In the past year, IEEE started to migrate its holdings to CD-ROM and will provide an appropriate Web presence for all of its educational offerings.

IEEE members demand low cost and flexible access to high-quality materials. For specialized topics, with audiences in the low hundreds at the most, it is not possible to recoup costs for low priced items. For that reason, many of the products on niche topics are priced high for an industry market at a much higher level than the individual can afford. IEEE plans to offer "free" tutorials to its members as a member benefit. To do this will require a differentiation of its commercial and "service" products.

In June, 2001 the IEEE completed a study of industry customers by Chris Burns, Inc., "IEEE Opportunities in Education," This study confirmed that industry users
prefer CD-ROM and Web delivered products and content that is modularized or "chunked." This study underscored industry's need for accountability—assurance that the materials purchased are actually used. For engineers, the decision to buy is made by individual engineers and their supervisors. The centralized

training organization in a company plays a supporting role—such as bringing educational opportunities to the attention of individuals and handling the actual acquisition.

IEEE Challenges

IEEE faces the challenge of using the Web to coordinate and deliver the educational programs of it 37 technical Societies, 3 councils, and about 200 sections. At present, many IEEE members lack access to IEEE courses. The ultimate aim is to deliver such courses electronically, including a number of overview tutorials free to IEEE members. IEEE's output of educational material is quite small when compared to the output of universities, publishers and other education providers that offer graduate programs and short courses for engineers. For that reason, IEEE is forming partnerships and alliances to expand the scope of its offerings.

In addition to serving as a gateway to courses and educational resources, IEEE PDI will provide a career planning tool called CareerNavigator that will foster the selection of courses based on "gap analysis." This tool will be coupled with field and discipline overviews as well as "maps" that will help users see the connection of topic areas needed to develop an effective educational plan. These maps will utilize the non-linear capabilities of the Web to show linkages within and among engineering disciplines. They will also connect theoretical and application areas so that engineers in industry are able to integrate and apply the knowledge that is generated by the IEEE Technical Societies.

IEEE PDI is envisioned for electronic delivery. At first, it will include various delivery media, including books, video, and CD-ROMs. In time, the bulk of educational experiences available directly through IEEE PDI will be in electronic form. Members will be able to enroll online for courses from the IEEE and its partners. IEEE PDI will also include educational resources, including narrated PowerPoints, applets and other "learning objects" that might be incorporated into larger courses. IEEE PDI will promulgate standards for the design and delivery of online courses through the IEEE Learning Technology Standards Committee (LTSC) <www.manta.ieee.org/groups/ltsc/>.

DLNET

The objective of DLNET is to develop a specialized collection of engineering and technology-related content targeted at the practicing engineer and technologist so as to facilitate "lifelong learning," i.e., education beyond the classroom using digital libraries. According to Saifur Rahman, Principal Investigator, DLNET thus hopes to bridge the technology and service gap, providing an easy and efficient way to collect, review, package and deliver information from the knowledge developer to the end user.

The DLNET interface or portal will consist of a web-based application that will enable content discovery through search and retrieval of local storage as well as by networking with external sources. It will include a standardized graphical user interface for posting and accessing the contents and an intelligent search agent for collecting and categorizing information from various sources and platforms. It will also provide a mechanisms for reviewing, ranking, updating and validating new and existing contents; mechanisms for addressing and acknowledging issues pertaining to copyright and intellectual properties.

The DLNET architecture and its services will meet the core standards and specifications adopted by the NSDL-CIS for digital libraries, and will become part of a larger network of learning environments and resources for science, mathematics, engineering and technology under the NSDL.

Conclusions

IEEE's educational activities are inextricably tied to its publishing resources. Courses developed through the IEEE will link to sources available through IEEE Xplore, a Web-based tool that provides powerful searching tools to locate IEEE publications. IEEE Educational Activities will harness this portal through the creation of the IEEE Professional Development Institute. This will provide information about lifelong education and "house" courses offered by the IEEE and its university and industry partners. Another distinct web-based service is the IEEE Career Navigator. This will bring together the various career resources throughout the Institute, including the many career-related services of IEEE-USA.

Since many of the courses offered through the IEEE will come from non-IEEE sources, IEEE's role as a broker of education will force it to concentrate attention and resources on the peer review of external courseware. As a broker, IEEE will also add value to education process by enabling courses to incorporate resources from the IEEE database, Xplore. In the coming years, IEEE will be improving this portal through the deployment of intelligent search engines.

For the IEEE and other associations, the Web presents many challenges to redefine publishing and education programs. There are the business challenges—pricing, effective marketing, protecting intellectual property rights—that may be unique to electronic publishing and educational delivery.

Then there are the challenges pertaining to user preferences and satisfaction. Web-based education is resurrecting fundamental issues in education pertaining to the design of the educational experience. A key one, particularly in lifelong education, is for learners to define their needs in terms of employer requirements as well as short-term and long-term career goals. Here professional associations can be a great service to their members, first by helping them to identify their needs and then to locate the appropriate resources to address these needs. The Web represents and opportunity to do this in a way never possible before.

Biographical Sketch

Peter Wiesner, Director of Continuing Education, has been with the IEEE since 1995. He was previously at Rutgers University. His background includes documentary film and video production and instructional development. He has taught in education, history, and communications. His educational background: B.A. History, University of California at Berkeley; M.A. Communications, University of Pennsylvania; and Ed.D. Education, Rutgers University.

Address: IEEE Educational Activities
445 Hoes Lane
Piscataway, NJ 08855
E-mail: p.wiesner@ieee.org
URL: www.ieee.org/pdi
Phone: (732) 562-5500
Fax: (732) 981-1686

Formative Evaluation and the Generative Process of Designing an Online Environment

Joanne G. Williams
Media Coordinator, Doctoral Student
University of Texas at Austin

Dongjoo Lee
Graduate Research Assistant, Doctoral Student
University of Texas at Austin

Willie Adams
Database Designer, Doctoral Student
University of Texas at Austin

Transforming a Face-to-Face Course for Online Instruction

The one semester Computer Supported Collaborative Learning (CSCL) course was previously offered in face-to-face classrooms at the University of Texas (UT), Austin, during the fall semesters 1997, 1998, and 1999. The transformation and re-visioning of the CSCL course from a face-to-face course to an entirely online course began in January of 2000. The online version of the CSCL course was first offered in fall of 2000 as a graduate-level elective course through the Department of Curriculum and Instruction at UT, Austin, and as graduate-level elective for the Online Educational Technology M.Ed. program which is physically housed at UT, Brownsville. The online CSCL will be offered in both locations again during fall off 2001.

The goal of the course re-visioning team was for the students to learn both *with* and about online collaborative learning. The philosophical and pedagogical stance utilized incorporated aspects of constructivism and included project-based and problem-based learning. The primary focus of the CSCL course was on the development of high performance learning teams. We recognized that moving a face-to-face course online involves more than creating Web pages and uploading materials. We carefully considered strategies to meet the unique support needs of online learning teams. A key design decision was the inclusion alternative forms of encouragement and interaction, via a course support team, to compensate for support that was previously afforded in face-to-face classroom interactions. The course instructor, Dr. Paul Resta, coined the term E-sherpa for the support member role. Sherpas are Tibetan people, skilled in mountain climbing, who live on the high slopes of the Himalayas. The function of a Sherpa on a mountain climbing expedition is to familiarize the expedition with the local terrain and to help members of the expedition carry their load. Likewise, in the CSCL course, the E-sherpas served to help the students navigate the online course terrain. The role of the E-sherpa differs significantly from the traditional and more authoritative roles of an online conference moderator or facilitator. Much like real Sherpas, the E-sherpa is neither the leader of the team nor do they have authority over a learning team. Rather, the E-sherpa's role is simply to help the online team "carry the load", and be successful in accomplishing its learning goals.

Weaving Assessment and Evaluation Strategies

Formative evaluation elements were woven into all components of the course to yield information that would support data-driven course revision decisions. A key evaluation strategy included observation by experts, which included the instructor, the course support team, and the course evaluator. The design team embedded team and product evaluations into each of the course modules to ensure both individual and team accountability among course participants. These evaluations provided formative data related to the key course goal, which was to build high performance learning teams. Additional formative evaluation information was gathered from analysis of the threaded discussions in Café CSCL, an informal online threaded discussion for course participants. We also analyzed the student's reflection papers which were written by individual students as they completed each course module and student comments during course WebCasts, online broadcasts, which involve communicating with multiple computers at the same time over the Internet by "streaming" live audio and live video. The E-sherpas and the instructor scheduled weekly telephone conferences during the semester to review progress, and to discuss what was going well as well as any emergent problems and their possible solutions. The regularly scheduled online WebCasts allowed the students to discuss and present their collaborative projects and afforded them an opportunity to discuss course-related problems and to highlight their accomplishments. Students enrolled at the University of Texas, Austin, were physically present for the course WebCasts and remote students enrolled through the University of Texas, Brownsville, telephoned in during the online WebCasts, or to participated in simultaneous online chat sessions.

Re-visioning a Face-to-Face Course for Online Instruction: Collaborative Course Design

The instructor formed the core instructional design (ID) course re-visioning team in mid-January of 2000. The core ID team consisted of the instructor, the project coordinator, and several graduate students. The ID team utilized a constructivist and collaborative approach for course transformation. The core ID team met face-to-face twelve times during the five-month period from January through May and audio taped their meetings. The course re-visioning team was cognizant that some materials and methods utilized in the face-to-face course would be applicable to the online version. However, they also acknowledged that a complete transformation of the course was requisite for creating a meaningful and productive online knowledge building community.

The primary goal of the design team was to provide thick authenticity in the course by utilizing a real-world metaphor for the learning context, student roles, project tasks, the organization, and structure of the virtual learning teams. Under the instructor's guidance and supervision the design and development teams worked collaboratively to create an online knowledge building community centered on a hypothetical company, CSCL Technology Inc. The core values of the work environment were based on five aspects: Communication, Community, Curiosity, Learning, and Teamwork. Projects and scenarios in this virtual work environment were based on genuine experiences and problems that course participants might encounter in actual work environments. The development of high performance virtual learning teams requires careful planning and integration of team-building strategies within web-based courses as well as new strategies and resources for supporting the online learning teams. A key ID team objective was the exploration of the use of E-sherpas as a unique support system for online learning teams.

Course Development: Creating an Inviting Learning Environment

The course development team consisted of five members: the instructor, the project coordinator, a Web developer, a database developer, and a graphic designer. The course materials and tools included the course Web pages for presentation of the course content and instructions for assignments, the database for peer and product evaluations, and a computer conferencing tool for communication and collaboration. The instructor developed a draft for each module of the course based on the decisions made by the design team. Next, the development team determined which existing face-to-face materials and concurrent supplemental web materials they could utilize for the online version of the course. New media and instructional materials were then developed. After the media decisions were made, the Web developer created a template Web page for each module assisted by the coordinator, the database developer, and the graphic designer. While the Web developer was creating a template Web page for a module, the instructor created a draft of the content for the next module. After the Web pages were created, the design and development teams reviewed each module. Finally, the Web pages were put on the servers for the course. Although the instructor and the design team were responsible for creating the draft of the course content, members of the development team also played an active role in revising the content during the production stage.

Design and Delivery of the Assessment Database

The development team began by brainstorming ideas that would enhance the CSCL course by enabling interactive and real-time assessment and evaluation. The capability of the existing courseware and the groupware, did not allow for uncomplicated modification of the systems. The challenge for the development team was to devise a method that would enable seamless integration of the assessment database into the context of existing courseware and groupware systems.

The team developed criteria for selecting a database tool that could track the online assessment activities. The desirable attributes included HTML support, relational capacity, simple administration, security, portability, and cost effectiveness. After evaluating several alternatives, the development team chose File Maker Pro, which is a relational database system. Another capability of this software is CDML (Claris Dynamic Markup Language) that extends the database functionally by interpreting a set of proprietary database specific tags within web pages. As we began to share our intentions of using File Maker Pro at the university, we discovered a network of colleagues using the software for tracking intra-departmental data. Having a network of people using the tool on campus proved invaluable later in our assessment tool development. We were able to get timely answers to question about setup, administration, and web publishing of data. However, no one with whom we consulted had extended his or her databases using CDML.

A graduate development team member who is employed as a professional software developer was given the task of extending the capabilities of the existing courseware and groupware in order to collect assessment data. The problem facing the database developer was how to devise a method that would vector course participants from the context of the systems that supported the content, to the assessment Web pages, which existed on a separate system, and then back to the content. The database designer utilized the assessment rubrics created by the instructional design team, and based on these assessment rubrics he created the data entry pages. The development team worked collaboratively to impart a common look and feel for the course content and the assessment database.

The E-sherpas: A Course Support Team

The vast volume of messages generated by members of virtual learning teams are often impossible for the online course instructor to keep up with on a daily basis. The instructor, therefore, decided to use E-sherpas, non-authoritarian support team members, as a support system for the virtual knowledge-building communities in the CSCL course. The instructor and project coordinator formed the E-sherpa team before the implementation of the course and conducted information sessions to familiarize the E-sherpas with the concepts, and strategies of their role. Several of the E-sherpas had also participated with the instructor in course re-visioning and development. The individuals selected for the E-sherpas role were graduate students who had the following characteristics:

- Prior knowledge of course content
- Prior experience working with online learning teams

- Good communication skills
- Interest in online learning environments

One E-sherpa was assigned to each six or seven member learning team. The E-sherpa role included the following specific behaviors:

- Guide for the requirements of the course
- Assisting with technical problems in the use of software or online collaborative tools
- Clarifying assignments
- Serving as guide for course requirements
- Offering additional references
- Providing feedback on students' work
- Facilitator for students' collaboration
  - Helping the team or individual members in the process of building their collaborative team
  - Reminding students of scheduled group activities
  - Providing positive feedback and acknowledgement for the successes of the online team
- Mediator between the instructor and students
  - Monitoring students' progress on assignments and collaborative activities
  - Checking students' feelings related to the pacing of the course
  - Sharing their course related observations with the instructor
  - Making suggestions for clarifying instructions and solutions to technical problems.

Online Instruction: Course Evaluation

Thirty-six students originally enrolled in the online CSCL course. These students included twenty enrolled through the University of Texas, Austin, and sixteen, which were enrolled through the University of Texas, Brownsville. Thirty-two students completed the course. Four students dropped the course due to scheduling conflicts and various other personal reasons. An appropriate mix of students from the local campus and students at located at various remote locations was a key consideration in assigning the students to their virtual offices and office suites in the virtual CSCL Technology Company.

Lessons Learned

Analysis of the end of course surveys and other evaluation data indicates that students in the course were generally satisfied with the online course, their own learning, and the teamwork and collaboration in their virtual offices and office suites. The performance of the learning teams and their knowledge building products met or exceeded the expectations of the instructor.

The results of the analysis of the E-sherpa's role suggest that the concept and use of a non-authoritative help person can be an effective and scalable support system for online learning teams. For this support strategy to be successful, however, E-sherpas and course participants must understand the support role. The E-sherpas need continuous training and support as they perform the important and complex tasks that the role demands. We learned that it is imperative that course participants understand the exact functions, roles, and responsibilities of the E-sherpa in relation to their virtual teams. Many of the course participants had nothing in their prior experience from traditional academic settings that enabled them to immediately understand the E-sherpa role. At first, the course participants expected the E-sherpas to direct their learning teams or to do the course work for their team. These and other misconceptions about the E-sherpa role helped us to realize that it may take some time and reiteration for students to fully appreciate and understand the role of the E-sherpa. Future research could seek to further clarify the roles of the E-sherpa and to identify effective ways of training Web-based course support teams.

Analysis of student postings to threaded discussions, student reflections, student comments during WebCasts, and student responses on the voluntary end of course survey, which was conducted after the course grades were submitted, indicates four primary areas of concern. First, students desired more feedback and interaction from and with the course instructor. Second, they were not pleased with one specific course tool that was selected to facilitate a collaborative project. Third, the off campus students felt that they had no "voice" in the WebCasts. The final area of concern reflected the students desire for more timely feedback on the peer and product evaluations, which they submitted via the assessment database.

Even though the assessment database was functional during the course, it required maintenance and revision during the course. The learners experienced issues commonly associated with computer-based systems such as server downtime, mal-formed pages, and less that intuitive sequencing of pages. We discovered that by facilitating a computer-mediated assessment mechanism, the learners experienced social issues with reviewing and evaluating each other. In the next iteration of the online assessment system, we will explore the use of Extensible Markup Language (XML) to replace CDML. XML will allow us to create special tags and data structures that can be dynamically rendered without the need of a common gateway interface (CGI). In addition, we have plans to automate our gathering and analysis of assessment statistical data. Our generative quality assessment system for course improvement entails the re-visioning of the CSCL course to address these concerns before it is offered again during the fall semester of 2001.

Biographical Sketches

Joanne Williams served thirteen years as secondary school teacher and five years as director of a high school computerized writing lab. She earned a M.A. in Educational Management and Development at New Mexico State University and is a certified teacher and educational administrator in two states. Joanne currently is a doctoral student in the College of Education at the University of Texas, Austin. She is focusing on the evaluation of online learning environments in her dissertation research. Joanne also works full time at University of Texas as an Instructional Designer and Media Coordinator for the Department of Chemistry and Biochemistry.

Address: University of Texas
Department of Chemistry and Biochemistry, A5300.
Austin, TX 78712
E-mail: joawilli@mail.utexas.edu
Phone: (512) 471-1645
Fax: (512) 471-6835

Donjoo Lee is a doctoral student at the University of Texas, Austin, in the College of Education, Department of Curriculum and Instruction, Instructional Technology Program. He earned a M.A. degree in Instructional Technology from Seoul National University. Dongjoo is currently working as a Graduate Research Assistant in the Learning Technology Center at the University of Texas at Austin. His job is helping faculty to integrate the Internet and WWW into their courses. His dissertation research interest relates to the building of learning communities in online collaborative environments.

Address: Learning Technology Center, SZB 438B,
University of Texas at Austin
Austin, TX 78712
E-mail: djlee@mail.utexas.edu
Phone: (512) 232-2189
Fax: (512) 471-4655

Willie Adams has almost twenty years of software development experience. He has worked for fortune 3M Co. and Dell Computer as a Software Quality Engineer. He earned a MS Software Engineering from The University of Texas at Austin. He is also an American Society of Quality Certified Software Quality Engineer. Willie is currently a doctoral student in the College of Education at The University of Texas at Austin. His focus is on promoting quality best practices within instructional and software design organizations. Willie currently works full time for Interactive Silicon Inc. as a Software Quality Assurance Engineer.

Address: Learning Technology Center
George I. Sanchez Bldg, Rm 438A
Austin, TX 78712
E-mail: wadams@austin.rr.com
Phone: (512) 232-2189
Fax: (512) 471-4655

From Student Reactions to Job Performance:
A Cross-Sectional Analysis of Distance Learning Effectiveness

Robert A. Wisher
Senior Research Psychologist
U.S. Army Research Institute

Christina K. Curnow
Associate
Caliber Associates

Debra J. Drenth
Research Analyst
Personnel Decisions Research Institutes

Although the literature on distance learning (DL) is quite substantial, reports on evaluations represent a relatively minor part (Koble & Bunker, 1997). What's more, DL evaluations have shied away from program effectiveness, focusing instead on usability, equipment quality, and learner preferences (Wisher, Champagne, Curnow & Pawluk, 1999). With respect to Kirkpatrick's (1984) four-level model of training outcome criteria, there are few studies that measure the third (behavior) and fourth (organizational) levels of the model. For organizations contemplating distance learning this is unfortunate, as there is little empirical work examining its effectiveness with respect to eventual job performance.

Evaluations of workforce training would be expected to link outcome variables to measures of job performance or productivity. But many of the published evaluations of DL in industry are only summative in nature. Little can be gained from summary reports to deepen our understanding of how DL affects job performance.

The present study originated from a request by the U.S. Army Sergeants Major Academy, El Paso, Texas, to examine the long-term effectiveness of distance learning. A course on Battle Staff training was selected due to its relative maturity (several years) in a distance learning format and its throughput of nearly 500 students per year. From a cognitive perspective, the tasks have much in common with the variety of analysis, synthesis, and evaluation tasks common to mid-level managers in a corporate division. Based on formative evaluations, the Academy understood that completion rates and test scores were fairly comparable between delivery methods -- the no significant difference finding. The Academy, however, needed empirical evidence that the learning outcomes gained through distance learning transferred to performance on the job – at least as well as did the training in the traditional classroom.

The reliable measurement of job performance, of course, has been subject to debate. The three sources most often used to rate job performance are self, peers, and supervisors. Self-ratings tend to be more lenient than supervisor or peer ratings. Peer raters can be a viable alternative to self-ratings because peers should have a great deal of information about a coworker's typical performance. However, peers often lack experience judging performance whereas supervisors usually have better calibrated performance norms due to their experience in evaluating subordinates. Perhaps the most compelling argument for using supervisory ratings is that they are more reliable. Viswesvaren, Ones and Schmidt (1996) found in their meta-analysis that supervisor ratings had higher interrater reliability than did peer ratings. Similarly, Conway and Huffcutt (1997) found supervisory ratings to be more reliable than both peer and subordinate ratings. Reliability is critical to performance ratings because it puts an upper limit on validity. Consequently, supervisors were deemed the most appropriate source to make job performance ratings for this study.

Method

Training Course

The Battle Staff Non-Commissioned Officer's course, hereafter battle staff course, prepares soldiers to manage the daily operations of a military command post or operations center. For successful completion, soldiers must acquire factual knowledge and demonstrate the ability to perform battle staff operations. The course is taught through lectures and hands-on practice sessions.

The twenty-four day course was conducted synchronously for six hours per day with weekends off. The residence version was taught in El Paso, Texas. The distance-learning version was conducted through a two-way audio, two-way video terrestrial or satellite connection. There were seven remote sites: five in the United States (GA, LA, NC, OK, and TX) and two in Europe (Bosnia and Germany). When factoring in the assistant instructors, the student-to-instructor ratio in either mode was close to 12:1.

For the residence mode, soldiers traveled to El Paso. In this mode, up to 100 students participated in each course iteration. In the DL mode, up to 69 students participated in an iteration. In the residence mode and at DL sites with more than 20 participants, students were segmented into smaller groups.

Instructors and Participants

The instructors, training materials, and program of instruction were the same in either version. Each remote site had one assistant instructor to monitor testing and provide additional feedback to questions. Selection to a particular version depended on the students' current location. If their site had a videoteletraining facility, they participated in the DL version. Otherwise, they traveled to and temporarily resided in El Paso. The two modes were conducted at separate times.

There were two rounds of data collection. In the first, n=297 course participants completed surveys at the end of training. In the second round, supervisory assessments were conducted on n=149 soldiers who had completed the course an average of 40 weeks earlier. Due to the lag between course completion and supervisory assessment, an average of nine months, there were few participants included in both the survey and assessment in the one-year period. Thus, the study was cross-sectional in nature.

Sample number 1. Upon completion of training, a survey was distributed to participants that included demographic measures and a five-item satisfaction scale. Pilot test data revealed high reliability for the satisfaction scale (alpha = .85). Course performance was measured by four tests that were administered throughout the training. Students were required to pass each test for successful completion of the course.

Sample number 2. For the second sample, participants were the subjects of job performance assessments by immediate supervisors. For supervisors to render a realistic assessment of job performance, it was necessary for soldiers to work in their new battle staff assignments for a sufficient length of time. The sampling was conducted between 6 and 16 weeks after course completion.

Supervisory scales. For the development of supervisory rating scales, subject matter experts first identified eight key skills acquired in the course as a basis for measuring job performance. These skills included task areas such as producing graphics and presentations, managing record keeping, and assisting in the military decision making processes. For each task area, a definition was generated and behavioral statements to anchor the ineffective (i.e., 1-2), mid-range (i.e., 3-5), and effective (i.e., 6-7) performance levels were generated. These behavioral statements were intended to provide benchmarks for supervisors raters to use when evaluating their subordinates. Research suggests that these anchors help raters to generate more reliable ratings.

Procedure

For sample number 1, the end-of-course surveys were distributed to DL and residence classroom sites. Instructors distributed the surveys at the end of training. Additional records of course performance and demographic information were obtained from the Academy.

For sample number 2, students who had completed within a certain period were tracked from the training to their current positions, and their supervisors were identified. Researchers traveled to various high-density sites to collect the assessments; others were conducted through the mail. The assessments were coded to protect the confidentiality of the rater and the ratee. Supervisors were given written definitions of the tasks and specific written instructions on how to rate job performance accurately. Finally, an eight-minute videotape that explained how to complete the assessments was provided to mail-in sites.

Results

Demographics

For sample number 1, the mean age was 34 years (SD = 4.5) and the average length of time in service was 14 years (SD = 3.69). The pay grades of all participants indicated they were in a position of leadership within the enlisted ranks. In terms of educational level, 31 percent of the participants had an associates degree or higher. Between the distance learning and residence groups, there were no significant differences in military branch (i.e., combat arms or combat support or combat service support) which could have potentially biased supervisory ratings on certain tasks due to an individual's previous experience (chi square= 2.09, p > .05). Data analyses of sample number 1 revealed the attrition rates between the distance learning and residence versions not statistically different at about 3 percent (chi square = 3.4, p > .05).

Level I: Satisfaction. Between delivery modes, the course satisfaction ratings were different. The DL group had had a lower average satisfaction rating (2.98) than the face to face group (4.31), showing a statistically significant difference (t = 13.39, p < .01). Students in the DL group were much less satisfied with the course than students in the residence group. Even though the course was identical in terms of materials, instructors, training time, and testing, students preferred the residence mode . When asked whether they would have preferred to take the course in the opposite delivery medium, students in the residence group largely said no, while students in the DL group largely said yes, further demonstrating the lower satisfaction with the distance learning mode.

Level II: Immediate learning outcome. Test scores between the distance learning and residence groups revealed slightly different results. Overall, the residence group averaged 89% compared to 87% for the DL group (t = 2.61, p < .05). Of the four tests, the residence group had statistically higher scores on two tests; there was no significant difference on the other two tests. The small overall difference of just two points carries no practical significance. Furthermore, historical course data from the Academy revealed no significant differences between modes of delivery when considering a larger sample size (greater than 500).

Level III: Job performance. The supervisory ratings were encoded on a seven-point scale with an additional block for "not part of job" in which case the supervisor had insufficient grounds to provide a rating. The supervisory assessment rating scales were seven-point with 1 being very in effective and 7 being very effective. The distribution of ratings did not reflect an upward bias as the two highest levels of ratings (six and seven) occurred only about one-third of the time. Table 1 shows the means and standard deviations for each of the tasks broken out by delivery mode.

Table 1.
Mean Supervisory Rating and Standard Deviation (in parentheses) by Task Area.

Task Area	Residence Group (n=61)	Distance Learning Group (n=38)
Recordkeeping	5.61 (1.24)	5.89 (1.16)
Graphics & Overlays	5.51 (1.22)	5.42 (1.44)
Military Briefings	5.29 (1.23)	5.28 (1.14)
Combat Orders	5.20 (0.99)	4.97 (1.55)
Planning	5.08 (1.04)	4.86 (1.42)
Combat Support	4.87 (1.01)	5.11 (1.55)
Decision Making	4.84 (1.22)	4.88 (1.01)
Intelligence Preparation	4.45 (1.17)	4.59 (1.46)
Overall	5.10 (0.95)	5.13 (1.34)

An analysis of covariance (ANCOVA) was conducted on supervisory assessment ratings across all eight task areas using reported experience as a covariate. The overall means for the residence group (5.38) and the DL group (5.24) were not significantly different (F (1, 96) = .14, p = .71). Furthermore, for the eight task areas individually, there were no significant differences between the residence group and the DL group assessment ratings. The results of the ANCOVAs indicate no differences in later job performance based on the mode of instruction.

Discussion and Implications

The results here demonstrate an interesting juxtaposition: although students were less satisfied with the DL course and would have preferred to take the course in a face-to-face mode, these perceptions had no practical bearing on immediate learning outcomes or job performance. In the framework of the Kirkpatrick model, the Level I outcome was independent of the Level II and Level III outcomes. This underscores the importance of measuring the effectiveness of DL beyond the level of student reaction.

The finding of no difference in job performance between graduates of the DL or resident versions was of substantial interest to the Academy as well as to the Army's major training command. As these and other organizations forge ahead with plans to transform certain courses from the classroom to a distributed learning architecture, it is vital to validate the long-term training payoff of this strategy. The present findings, of course, can neither be generalized beyond the type of tasks under investigation here nor to other delivery modes, such as Web-based instruction.

Organizations must move with care towards DL, attending not only to student perceptions and immediate learning outcomes, but also to the long-term results of training. By following the model set forth by Kirkpatrick and evaluating training outcomes beyond reactions and immediate learning, a greater understanding of how DL influences the learning process can be achieved and its lasting benefits can be documented. The current study contributes to the DL literature by documenting the seldom-examined, long-term results of distance learning in an organization. Since the video teletraining method of delivery was a substantial replication of the classroom, in which the instructor was visually and verbally present, it is not clear how well a transformation to other modes of delivery or methods of instruction would fare.

The Department of Defense is promulgating the Advanced Distributed Learning Initiative (www.adlnet.org). This strategy is expected to rely more on a learner-centric approach, with a distance learning strategy tied to e-learning technologies (Bonk & Wisher, 2000). Collaborative learning, virtual realities, instant messaging, and many other technologies are changing the training landscape. These new tools are not mere replications of the classroom. As these training tools are adapted, it is important to measure learning outcomes, both immediate and retained. One would anticipate that with the advantages of tailored instruction, interactivity, thoughtful feedback, spaced practice, and so forth, the learning outcomes would exceed those imparted in the traditional classroom. The finding of "no significant difference" between an advanced distributed learning strategy and the classroom should some day be no longer acceptable. Hopefully, these learning benefits will also transfer to workplace performance.

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Biographical Sketches

Robert A. Wisher is a Senior Research Psychologist at the Army Research Institute in Alexandria, Virginia. He also serves as a Policy and Evaluation Strategist to the Advanced Distributed Learning

Initiative, Office of the Secretary of Defense, Readiness and Training Directorate. He holds a doctorate in cognitive psychology from the University of California, San Diego.

Address:
E-mail: wisher@ari.army.mil
Phone: (703) 617-5540

Christina K. Curnow is an Associate with Caliber Associates in Fairfax, Virginia. She holds a doctorate in Industrial and Organizational Psychology from the George Washington University. Her research interests and experience include DL evaluation, assessment of training outcomes and individual differences, survey research, and selection test development and validation.

Address:
E-mail: curnowc@calib.com
Phone: (703) 385-3200

Ms. Debra J. Drenth is a Research Associate with Personnel Decisions Research Institutes, in Tampa, FL, and is a doctoral candidate in the Industrial and Organizational Psychology program at the Univ. of South Florida. Her areas of research are DL evaluation, test development and validation, organizational citizenship behavior, and recruitment.

Address:
E-mail: Debbie.Drenth@personneldecisions.com
Phone: (813) 229-6646

Guided Self-Directed Learning: Strategies for Distance and On-Site Education

Sherry Wulff, Associate Professor
Alverno College

Elizabeth Burke
Manager of Training and Development for North America
CHR. Hansen, Inc.

Judith Hurley, User-Centered Design Specialist
Northwestern Mutual Life Insurance Company

Our summary paper and presentation represent a work of action research in progress. Drawing upon Shirley Grundy's (1987) definition of action research, we are at the start of a reflective, strategic process of study wherein we as educators are investigating our teaching, training, and user-design practices. Our intent centers on making meaningful change in our practices and subsequently in the learning experiences of our students and the users we design for. Motivated by the broad negative-positive range of our observations, experiences, and responsibilities linked to students and users learning and working with technology in distance and on-site business and academic environments, we began to explore implicitly and explicitly a variety of self-directed learning (SDL) techniques, strategies, and processes. Our broad goal, quite simply, is to contribute to and support effective technology-based learning and teaching in distance and on-site situations.

Our co-author Elizabeth Burke notes that as a training manager for the CHR. Hansen Corporation, she is always looking for improved means to offer and deliver training that contributes effectively to the organization and to advance employee careers. Thus she is concerned about the right type of training for specific sets of learners/employees, when it is needed, and locating those training formats and strategies that not only support learner/employee skill development, but develop self-confidence in learner/employee skill development and abilities. SDL is of high interest to her because she believes it offers advantages in delivery and motivation for learners/employees in distance and on-site instructional environments. Even more pertinent is the tradition of SDL, which calls for learner initiative and involvement in defining the outcome, selecting resources, and constructing a plan of learning actions (e. g., Knowles 1975, Houle 1984, Long 1998, and Bulik and Romero 2000). SDL strategies also suggest a means to develop an ongoing mentor/coaching plan for an individual's long-term development, thus moving learning into a strategic strategy for development and change.

When first exploring SDL, we along with our students and users in business and academic contexts asked (and continue to ask) the following questions among many others: What are SDL strategies and processes? How are they different from other teaching and learning strategies and processes? Is learning inherently, but not always consciously self-directed? Do learners know how to be self-directed in general and specific learning situations? Can/should self--direction be taught? Does SDL mean the lack of stimulation, direction, structure, challenge, and guidance from the trainer, professor, or designer? What triggers an individual's need to seek learning? What motivates an individual's successful completion of a learning experience? If the learning experience has been self-directed, then what is the best approach for assessing the quality of the learning experience and whose standards should be used for assessing the learning outcomes or products?

Our initial work with these questions in our practice as educators and designers prompted us to revisit and reshape the first question (What are SDL strategies and processes?) into What are effective SDL strategies and processes in distance and on-site business, academic, as well as user learning situations? We also formulated a second key question for our project: How might self-directed learning motivate learning action in both business and academic environments? Our practice in light of and response to these new questions led us to a position that self-direction can be an exciting, viable, and reliable learning strategy and process in technology-based business, academic, and user instructional situations, IF it is guided. Furthermore, the degree of guidance depends on the learner or user and the learning-using context. Keeping this position in mind and given our range of instructional responsibilities, which include distance, on-site, and blended education as well as the instruction of use in user design, we began construction of several support pieces for our project. These currently include a working chart of distance learning and self-direction--potential advantages and disadvantages, a working description of guided self-directed learning (GSDL), and a working model of GSDL with a set of learning actions.

Distance Learning and Self-Direction Potential Advantages and Disadvantages

The following working chart of the advantages and disadvantages of distance learning and self-direction is based on our personal educational practice, the experience of other education and user-design professionals, and author William A. Draves (2000) top 10 reasons why cognitive learning on the Internet is better than traditional in-person presentations.

GSDL can be described as continuum of instructor-student responsibility and actions during the learning experience. The instructor establishes a foundation of learning standards and guides as students develop self-direction in content-practice fields. GSDL emphasizes the following factors as integral to considering and maximizing learning and learning actions:

1. Constructivism, which situates "learning as an interpretive, recursive, building process by active learners interacting with the physical and social world" (Fosnot, 1996, p. 30);
2. Presence, which realizes the degree of physical and psychological learner-learning engagement (Wulff, Hanor, and Bulik, 2000) and lays the conceptual foundation for considering learning action-interaction on intra- and inter-personal levels;
3. Communicative Interaction, which emphasizes that processes, however brief, of connected communication actions conveyed through one or more modes and taking place on intra-personal, inter-personal, and/or mass levels mediates learning;
4. Reflection, which views the self as "knowing in action" (Schon, 1987, p. 25) and "reflection honors the capacity of the individual for internal dialogue, a conscious presence with self. Critical self-reflection adds clarity and structure to the inner landscape, it also alters the frame through which we view, experience, and come to know the world" (Wulff, Hanor, & Bulik, 2000, p. 151) and, in a sense, come to know what we learn.

Working Chart of Distance Learning and Self-direction
Potential Advantages and Disadvantages

Potential Advantages	*Potential Disadvantages*
I. Content-Learning Issues:	
Learn at your own peak learning time of day in the comfort of your own home and on your own computer.*	Lack of computer – forced to work in a computer lab at odd hours and class may be time-specific.
Learn at your own speed.*	Unsure of Communications norms.
Learn faster.*	Inability to keep up with email postings and readings.
Learn from foremost authorities and experts.*	Lesson plans may be poor in quality or lack clarification of expectations.
Abundance of class offerings.	Don't know what to pick from
Can pursue interest in content area or field.	May not be aware of • content parameters • content foundation (what required skills may be necessary for success).
Implement own learning style.	Unaware of own learning style (may have limitations).
User may be able to track own progress.**	Structure may prohibit own tracking.
User may be able to test own learning.**	Own testing may not be available.
II. Technical Issues	
Experience new technology and software.	Unfamiliar with computer technology and operation commands of online software.
Online learning is less expensive and more accessible*	May experience technical difficulties, particularly at peak usage times.
Internet links provide more resources.*	Too much information – don't know what to choose.
III. Social Issues	
Interact more with teacher.*	Lack of immediate assistance from the instructor.
More discussion online.*	Inability to keep up with online discussions.
Participants may come from around the world.*	Problems with non-native speakers.
You can form a virtual community.*	May experience loss of Social Interaction • Feeling isolated • Loss of motivation • Frustration, anger, hurt feelings.

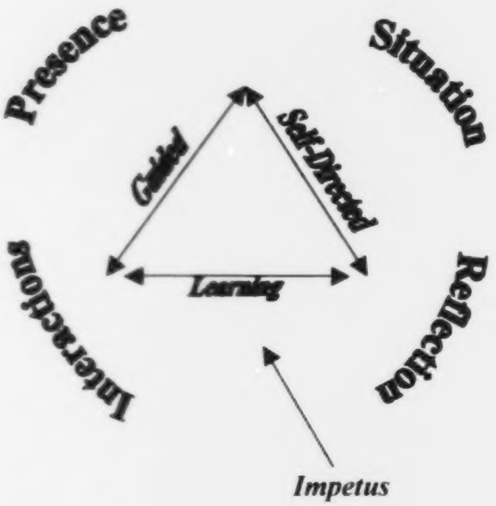
* (Draves, 2000, p. 13.)

** (C. Girmscheid, personal communication: analysis interview, 2001)

Working Set of Actions

1. An impetus motivates learning actions. For example: learners may be triggered by some stimulus to seek learning as a solution to the problem encountered. The trigger can be a perceived as a lack of ability or an identified lack of knowledge/skill by an external authority, or a block/breakdown encountered by learners.
2. Learners share (on a continuum) with the instructor/trainer responsibility for initiating, planning, implementing, and evaluating learning experiences and outcomes.
3. Learners need to perceive that learning is purposeful, includes conscious actions on their part, and results in skill acquisition and knowledge construction that meets their learning needs and resolves problems or issues, which motivated or stimulated the learning.
4. Learning experiences need to build upon the individual's experiences and prior knowledge, protect and build learners' self-esteem, as well as provide positive reinforcement for continued development. (While reflective of adult leaning theory, we believe the basic premise of this action is true for all learners.)
5. Strategies for learning achievement need to be flexible, adaptable, and available to the learner. In business contexts strategies for learning achievement need to be as close to the time the learning need occurs as possible.
6. Alternative delivery approaches are influenced and/or determined by the learner. In the business setting assistance from the organization may increase the alternatives available to learners, while in the academic environment learners may be assisted by the institution in identifying alternative approaches for their individual needs and/or learning style. (informed by McNamara, 1996).

**Working Model for Guided Self-Directed Learning
With a Working Set of Actions**



As noted in the opening of our paper, we are at the beginning of an action research project that began with an exploration of SDL in technology-based, distance and/or on-site instruction for business and academic settings. Our project led to a perspective that positions self-direction as a viable and reliable learning strategy and process in technology-based business, academic, and user instructional situations, IF it is guided. Specific settings and situations for this paper and presentation included distance and on-site training contexts for an international corporation, technology curriculum for a small Midwestern liberal arts college, and user designs for web-based communications within a large insurance company. Drawing upon our practice in these settings, we offered three working support pieces in an effort to respond to two key questions: (1) What are effective SDL strategies and processes in distance and on-site business, academic, as well as user learning situations? and (2) How might self-directed learning motivate learning action in both business and academic environments? Each of the three support pieces represent a draft synthesis and are currently titled as follows: a Working Chart of Distance Learning and Self-direction--Potential Advantages and Disadvantages, a Working Description of Guided Self-directed Learning, and a Working Model of GSDL with a Set of Actions. In our conference presentation we intend to share a draft of concrete GSDL strategies for distance and on-site training, college, and user instructional situations. We will also share a set of student reflections on their SDL and GSDL learning experiences.

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Biographical Sketches

Sherry Wulff is an Associate Professor in the Professional Communication Department and in the Instructional Design track of the Master of Arts program at Alverno College, Milwaukee, WI. Along with teaching responsibilities, she serves as the Media Technology Coordinator the Professional Communication Department. Wulff's research, presentations, and publications focus on self-directed learning, media-technology literacy, and analyses of communicative structures in pedagogy.

Elizabeth Burke, a Manager of Training and Development for North America at CHR. Hansen, Inc. assists with all corporate wide training and development activities that will be delivered in North America. She also plans, coordinates and delivers local training as identified in cooperation with the senior managerial staff. Additionally, Burke has been a trainer and OD consultant for ten years, working both within both Manufacturing and Financial organizations.

Judy Hurley is a User-Centered Design Specialist at Northwestern Mutual Life Insurance Company in Milwaukee, Wisconsin. She has more than 20 years of experience in technical writing and training. Her expertise spans user-centered, information, and instructional Design, along with Usability Testing, As a user-centered design specialist, Judy works on a multi-discipline team creating usability tests for products used by Northwestern Mutual's personnel.

A Case for Case Studies in Online Instructional Design

Rosalyn H. Zigmond, President
Educational Design Group, LLC

Case method learning (CML) is well suited for online delivery. Based on the theoretical platform of problem-based learning (PBL), case studies can provide constructive learning opportunities for all learners. And integrated with the classic tenets of instructional design processes, CML becomes a powerful approach to learning in the K12 system, higher education, and corporate learning programs. The purpose of this paper is threefold. First, it summarizes the roles and responsibilities of the instructor and learners in case method learning and its educational benefits for learners. Second, this paper summarizes the process, roles, and benefits involved in problem-based learning and how PBL acts as a theoretical underpinning for CML. Third, this paper presents a brief review of instructional design principals coupled with specifics on online delivery and suggestions on how to design online instruction using case studies.

Case Method Learning

Description

Organized case method learning in business education started in 1920s with the Harvard Business School (*Learning with Cases*, 1989). Today, the Harvard Business School is one of the largest producers of business cases for educational purposes. The cases are typically real life situations and stories based on authentic professional and personal experiences. They provide a focal point, or a springboard, upon which learners can discuss their own experiences (*Writing Cases and Teaching Notes*, 1998). Therefore, case method learning provides the opportunity for learners to integrate knowledge from many fields into a single discussion focused on a single case study.

Role of Facilitator

The facilitator of case method learning has a distinct role and responsibility, acting as a guide for learners, not an instructor who imparts content. He or she challenges learners to discuss, debate, and defend their arguments related to the case study at hand, not only to help them to develop their own ideas, but to focus their presentation of those ideas (*Learning by the Case Method,* 1987). The ensuing debate can, and should, be rigorous and the facilitator should feel comfortable as a participant (*Learning with Cases*, 1989). He or she can discuss the pros and cons of various solutions raised in the debate or assume an interventionist role and point out critical conflicts. The facilitator can also suggest discussion questions and encourage learners to discover and formulate their own questions. Prodding learners to explore missed areas is another role of the facilitator, helping to ensure comprehensive content in the instruction.

An important role of the facilitator can include summarizing discussions and drawing conclusions, perhaps in a mini-lecture (*Learning by the Case Method,* 1987). He or she can also encourage the learners to synopsize the discussions, which would add an additional dimension to their learning. The facilitator can record and organize the group's analyses according to their contributions, not the facilitator's impression of what they should be. This organization and analysis can then become a valuable product of the learners' contributions.

CML Role of Learners

Case method learners follow a typical, but not compulsory, process and own important responsibilities in that process. They first peruse the entire case. Leafing through every page of the case gives an overall impression of its topics and direction. The learners also inventory their knowledge bases on the topics and identify what they know and what they don't know to solve the problem. If they need additional resources to proceed, they must locate and access them. The learner then rereads the case closely. During this phase, learners note and analyze key problems and issues in the case. As a result of this close reading, the learner develops a set of recommendations that can be solutions to problems situated in the case. Finally, the learner discusses issues and defends his or her analyses against other learners who have different experiences and knowledge bases (*Learning by the Case Method,* 1987). The most critical role of the case method learner is to contribute his or her ideas and share experiences in discussion and debates.

Disadvantages

Case method learning is not perfect for all learners and its disadvantages deserve mention (*Learning with Cases*, 1989). Problems presented in cases have no right answers, which can frustrate learners who have a relatively low tolerance for ambiguity. Some solutions may be more viable than others, but cases do not elicit concrete right or wrong answers. Another "disadvantage" is the phenomenon that learners must assume ownership in case method learning to harvest its benefits. Because the facilitator does not directly teach content, learners must teach themselves content. Not all learners are developmentally ready to assume this level of ownership, but then, case method learning can prepare them for it. Yet another attribute of case method learning that can be construed as a disadvantage for some is that it is hard work and requires frequent self-assessment to be constructive. It is active, engaged learning. And learners must be constantly aware of their own progress and contributions to the learning process. Are these disadvantages? For some learners they might be. But for others, they can be advantages.

Benefits for Learners

Case method learning yields many benefits for learners. Foremost, it sharpens their problem-solving and analytic skills during the course of discussions and debates with their colleagues. It helps learners discover their own personal educational needs instead of being mandated externally by instructors and curriculum developers. CML also develops learners' sense of self-evaluation, self-regulation, and self-directed learning skills. These are metacognitive skills that learners hone as they optimize their own accomplishments in thinking and learning. When the role of the facilitator is that of a guide and not of a dictator, the learner develops how they monitor and improve their learning on their own, in their own terms. Yet another benefit for case method learners is that they can simultaneously integrate several disciplines, concerns, and resources in a single discussion (*Learning with Cases*, 1989). This helps them to see the relevance between otherwise contrasting concepts, a critical skill needed for transferring knowledge from one topic to another topic, even in different environments, which can sometimes cause problems for learners.

Problem-Based Learning

Description

Problem-based learning (PBL) is well rooted in medical curricula, but has a place in all subjects and environments. Howard Barrows, medical doctor and professor, is known for his research and writings on designing instruction for problem-based learning. PBL has notable traits (Barrows, 1996). It is foremost student-centered, meaning that it is structured so that the learner can apply his or her level of prior knowledge to the learning task and advance from that point. Learning occurs in small student groups as well as individually; each context, group and self-directed learning, are critical elements of PBL. Also, the "teachers" of problem-based learning are facilitators, or guides, and are referred to as tutors. Problem scenarios form the organizing focus and stimulus for learning. Learners extract information from these problems and build new knowledge upon them. The problems then serve as a vehicle for the development of clinical problem-solving skills, as in medical curricula, or as management problem-solving skills, for example, in business.

Process

The problem-solving process in PBL is specific, although even Barrows acknowledges that the process can assume different variations in adherence to the process as long as a problem situation is central to the learning and instructional design (Barrows, 1986). Nevertheless, the process begins with the problem being encountered before any preparation or study has occurred. In other words, no other instruction regarding a relevant topic should be encouraged before the PBL sessions. Next, the problem situation is presented in the same way it would occur in reality. The authenticity of the problem is crucial in the success of its impact on learning (Birch, 1986). The learner then works with the problem at his or her level of learning and reasoning as well as its challenge and evaluation. Needed areas of learning can then be identified by the learner and used as a guide to individualize further study. Weaknesses in prior knowledge, for instance, are detected by the learner as he or she analyses the problem firsthand, not by the instructor as it would in a traditional situation. The learner then applies his or her newly acquired knowledge to the problem to evaluate its effectiveness and reinforce their learning. The learning that has occurred in individualized study is finally summarized and integrated into the learner's existing knowledge and skill base.

Educational Objectives and Benefits

The educational objectives, benefits, or outcomes, of problem-based learning are considerable. Included in these objectives is the acquisition of a knowledge base that integrates several domains of learning. Learners develop their problem-solving skills, discover their personal educational needs, engage in active learning, self-assess and self-direct their own learning. PBL encourages the acquisition of a knowledge base enmeshed with problem-solving processes. The development of an effective and efficient clinical problem-solving process, or business problem-solving process, is another outcome. Educational objectives in PBL also include functioning and contributing to team-based learning. It encourages internally motivated ownership in learning and strengthens learners' pursuit and application of external resources when solving problems (Albanese, M.A. & Mitchell, S., 1993).

Role of Tutor (Facilitator)

The facilitator of problem-based learning is commonly referred to as a tutor. The roles and responsibilities of the tutor are specific and help learners maximize their learning. Tutors guide students through the learning process--they do not lead them through the process with explicit directions. They also encourage students to attain a deep level of understanding the topic by encouraging them to seek proper resources for their learning. Tutors ensure that all students are involved in the group process and contribute to group dynamics as well as learn from them. They monitor the progress of individual students, helping them to develop their metacognitive skills of self-direction, self-assessment, and self-regulation.

Designing Instruction with Case Studies

Process and Product

Instructional design is both a process and a product. As a process, it follows a series of steps that include assessing needs of the learners; designing learning objectives, activities, and assessments; developing materials for the facilitators and learners; delivering the instruction for classroom, online, or computer delivery; and evaluating every phase of the process, preferably on an ongoing basis. As a product, instructional design is the blueprint for instruction that captures the phases involved in the process that created it.

Instructional design for case method learning recognizes that the learners and facilitators determine the content, not an external curriculum developer. As cases are discussed and debated, learners and facilitators bring different topics and experiences to the table. These topics become the instructional content and are supported by appropriate learning activities, such as papers that learners write or projects they design and create. The instructional design also includes assessments that reflect learners' progress formatively and summatively. Criteria for self-assessments and self-evaluations evolve from the content raised in the discussions.

Another important aspect to incorporate in the instructional design for case method learning is that it promotes experiential learning, a significant value in education (Dewey, 1938). CML is experiential because it is anchored in reality, not textbooks. The cases reflect real life situations with real life people. Authentic cases encourage learners to share their own authentic experiences, enriching its experiential benefits. Case method learning is learner-based, designed for the sake of learners to develop themselves and their knowledge, not for the sake of their instructors or facilitators. The careful process and articulated product of instructional design for CML can be powerful and personal for learners.

Online Design Tools

Online instructional design entails certain available tools, tools that can conveniently deliver case method learning when used with discretion. The most common tools used in online, or web-based delivery are the following (Horton, 2000):

Table 1
Applications of Common Online Designing Tools

Tool	Application
Threaded Discussions	Threaded discussions are the most appropriate online tool for case method learning. The discussions and debates are critical activities for learners to develop their ideas and to defend their arguments. Sharing in this asynchronous environment gives participants the opportunity to ponder their responses and offer thoughtful insight into their contributions. All learners in the online session have access to the threaded discussions, benefiting everyone.
Email	Email is a commonplace communication tool and should be included as a communication staple in online learning. Its versatility lies in the fact that message senders can control who will receive their message. But in the case of whole group discussions about a case in CML, all participants should be privy to all messages.

External links to documents	External links to other documents enrich the resource base of online learning; that is, one learner can share documents with his or her colleagues online, without having to locate or produce them.
Chats	Chats are another synchronous tool that allow for immediate feedback from participants. This is a close reflection of face-to-face traditional classroom discussion available online. Spontaneity is valuable in discussion and debate, but all participants must be online at the same time in order to participate.
Whiteboards	Whiteboards provide synchronous illustrating opportunities for learners to share how they understand issues visually with their colleagues. This technology can realize concept mapping, an outstanding method of developing ideas in a group or individually, which can be saved or shared in real time.
Screen sharing	Screen sharing can also benefit case method learners as they share their experiences and research that they have found on the Internet. But again, technology on the creating or receiving end may restrict its use.
Audio and video conferencing	Audio and video conferencing are dependent on the technology available to create them, deliver them, and access them. These conferencing applications can be appropriate in the delivery of case studies online, as learners would be able to listen to and watch someone present the case. However, their technological restrictions should be noted when designing instruction.

Online Delivery Modes

Instructional design also dictates the delivery of the learning. Online learning can be presented in self-paced or instructor-led delivery modes. It can also be delivered in hybrid presentations of self-paced with instructor as facilitator or instructor-led with self-paced chunks. Strictly self-paced learning has no facilitator, thereby eliminating it as a mode for delivering case method learning. An online instructor-led mode, however, is certainly appropriate for CML. Self-paced with instructor as facilitator is also a possible delivery for CML, although the opportunity for group and teamwork is not as easily facilitated as with an instructor-led delivery with self-paced chunks.

Conclusions

Case method learning (CML) is well suited for online delivery, provided the instructional designer is familiar with the theoretical underpinnings of problem-based learning and foundations of sound instructional design. Facilitators and learners learn together to identify content, access informational resources, and debate issues pertaining to the case or problem. Online discussion tools such as email, threads, and chats support these critical dialogues. Individual learning occurs as well, when learners are given the time to process the content presented in screen sharing, whiteboards, and audio and videoconferencing. Perhaps the forte of case method learning is that learners have the opportunity to learn from real life situations derived from authentic experiences. What affords learners more power in their learning experience than to encourage their ownership, apply their personal experiences, and debate solutions with other learners? Even better is the fact that more people have access to this type of powerful learning online as well as in the traditional classroom.

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Biographical Sketch

Rosalyn H. Zigmond is president of Educational Design Group, LLC, a Colorado-based firm that specializes in corporate training, instructional design, professional development, technical writing, and educational consulting services. Ms. Zigmond's expertise is designing and facilitating web-based and instructor-led training. She holds degrees from the University of Colorado and the University of Michigan. Ms. Zigmond has taught a wide gamut of writing courses including technical, expository, creative, essay, and newspaper writing and study skills in higher education since 1991. She has also facilitated many professional development workshops and seminars and has presented her research at several professional national conferences.

Address: 11760 E. Asbury Ave.
Aurora, CO 80014
Phone: (303) 489-1410

❖ Workshops ❖

Still More Advances in Web Pedagogy: Motivating Adult Learners, Motivating Instructors

Curtis J. Bonk, Ph.D.
Associate Professor, Indiana University
President, Courseshare.com

Vanessa Paz Dennen, Ph.D.
Assistant Professor, San Diego State University

According to recent college faculty and corporate trainer surveys we have conducted, the proliferation of Web courseware and training programs has yet to match the pedagogical needs of higher education and industry. As a result, student motivation and retention are major online learning issues. Complaints abound about the higher attrition rate and lack of interaction in online environments. However, few designers of e-learning tools have considered the motivational principles behind adult learning. How can such tools motivate adult learner participation while fostering student thinking and collaboration? What can be done to motivate learners in online environments? These questions must be addressed in order for online education to grow and thrive and in order to provide positive learning experiences for students.

There are a variety of techniques that can be used in an online learning environment to generate learner interaction and motivation. This paper focuses on ten motivational techniques or methods that may be used with adult learners, whether the environment is a higher education or a corporate one.

Tone/Climate

The tone or climate of an online class is set at the beginning. These opening moments have the potential to engage and interest learners so that they want to be active participants for the semester, or alternatively to isolate them, providing little motivation to participate. Much like in the physical world, if one visits an online location and finds little reason to go back, feels uncomfortable in that place, or is uncertain of its purpose, one is not likely to quickly become an active participant.

Ice breaker activities can be used to set the tone of an online class, and to help learners get to know one another. They also serve the purpose of helping learners get familiar with the course tools without the stress of dealing with course-related subject matter. Some activities that might be tried include:

1. **Two truths and one lie:** Everyone must post two truths and one lie about themselves. Fellow classmates then try to determine which one is the lie. This activity generates a series of messages and responses and is a quick way to bring out everyone's personalities.
2. **8 nouns:** In the 8 nouns activity, everyone is required to post 8 nouns that describe them. By the time they reach the end, it becomes difficult to come up with nouns and participants share a good deal of information about themselves.

Both of these activities are fun ways of sharing personal information. While we may not share this much personal information at the beginning of a traditional course, in an online course it is a way of "seeing" who is in the class. In our experience, both instructors and learners tend to refer back to the messages generated by these activities to get a better sense of who their classmates are.

The instructor should model the expected responses to these and other activities and be a participant as well. Just as the learners need to know who their peers are, they need to know that their instructor is more than just a name.

Feedback

Feedback motivates online learners by letting them know how well their performance meets expectations. While feedback points are typically built into all courses in the form of graded assignments, in an online class students often feel the need for feedback at various points in time. This feedback helps them gauge their own performance and motivates them to either maintain or improve the quality of their work. Feedback may come in many forms:

1. **Self-Assessments.** Self-assessments can easily be built with most courseware tools, allowing the computer to do all of the work of providing feedback.
2. **Reading Reactions.** Discussion activities in which learners post their reactions to course readings are useful because they allow the learners to know if they are on-track, and let the instructor know if the learners are understanding the material. Additionally, learners are more motivated to do the required readings if they know they must discuss them. Peer feedback points can be built into such activities, making sure all learners get a response in a manner that is pedagogically beneficial yet not labor-intensive for the instructor.

Engagement

Motivated learners are engaged learners. While all of the motivational methods mentioned in this paper are, in some way, engaging, electronic voting and polling is one technique that can be used to engage learners at the beginning of a new unit of instruction. Many courseware tools allow for polling or surveying participants. An instructor might survey class attitudes on an upcoming topic, and keep the results sealed until an appropriate point during the instruction. The instructor might then use the results to engage learners in discussion of the minority point-of-view first (since it is otherwise less likely to come out), or to see if attitudes have changed as a result of the instruction.

Meaningfulness

Meaningfulness is a motivational principal that we see enacted around us all the time. People want to participate in activities that they deem meaningful. In the traditional classroom meaningfulness is important, but an instructor might corral students to participate just because they are physically present. In the online classroom, meaningfulness might make the difference between participation and non-participation. Online activities that are meaningful to students often center around real-world scenarios and allow students to talk about their own opinions and experiences relative to these scenarios. For example, students might be asked to post reflection statements that relate their job or field experiences to the concepts being learned. They may be asked to develop written cases that exemplify a concept, or to comment on a written case, providing a solution or response from their perspective. These activities give students an opportunity to practice and apply what they know, and thus become meaningful and motivating.

Choice

Giving learners choices allows them to be active participants and feel in control of some aspect of their learning environment. Online classes can at some times be so highly designed experiences that students feel they have no choice, but rather must follow the course outline from A to Z. There are many ways in which choice may be built in to an online class. Learners may be given the opportunity to select which discussion topics they wish to participate in, and they may be asked to help develop the discussion topics as appropriate.

Variety

Doing the same thing over and over again can be boring. Learners enjoy variety in online courses — knowing that there is something new for them to master keeps them alert and attentive as well as interested. Instructors should try a selection of different online activities rather than just the same one or two over and over.

Brainstorming is one simple activity that can interject some new life and variety into a course. Learners can be asked to generate as many ideas as possible on a particular topic, without worrying about backing them up, demonstrating their applicability or practicality, or ranking them in any way — activities which all may be addressed later in the course.

Curiosity

Learner curiosity should be cultivated in an online course, and this means exploration of ideas beyond those expressed by the instructor. If all learners look to the instructor for answers, learner curiosity can only be addressed through limited perspectives. Electronic guests may be invited into the online class either for chat sessions or asynchronous discussion periods, to bring in additional viewpoints. Furthermore, learners may be mentored electronically by peers or practitioners to help bring in diverse perspectives.

Tension

Points of tension are points of discussion; if we all agree then we probably have little to discuss. The term "tension" frequently has negative connotations, but it can be used to generate fruitful learning discussions. Student may not, however, elect to engage in tension on their own so debates and assignments that involve role play dialogues can be particularly useful to generate tension in a manner that feels safe to students. Frequently when students are assigned roles that promote unpopular points of view they will preface their remarks with statements like "I was told to be the protagonist, so … "; these declarations allow them to engage in the activity while distancing themselves from the viewpoints they uphold in the activity and still feeling socially acceptable themselves. This is the optimal situation: tension in an environment that is comfortable for all participants.

Peer Interaction

Peer interaction helps engage students with each other. In traditional courses, even when the instructor does not explicitly facilitate peer interaction, students tend to discuss course-related topics before or after class. In an online class, without peer interaction students may feel isolated. Many of the techniques referenced in this paper involve peer interaction on various levels. Peer interaction may be considered a goal or activity unto itself through the use of e-mail pals or critical friends. In these activities learners are partnered up to provide each other with constructive feedback on assignments (or perhaps drafts of assignment before they are turned in). Alternatively, they might be tasked with sending each other reminder messages of upcoming due dates, or participating in project idea generation activities. These activities may take place publicly, via courseware, or privately, via e-mail. Both the student who gives and the student who receives the feedback will benefit from these activities. An additional benefit is that these activities ensure students are receiving much-needed feedback with a minimum of burden on the instructor.

Goal Driven

Student motivation to participate in online class activities tends to be goal-driven. If the goals as presented by their course focus on test performance, students are motivated to study for the test. Group problem solving activities are a great way of avoiding such isolated, low-motivation scenarios. Students who have a goal that they must work toward together will be motivated to interact with each other. Group problem solving activities can be as large as semester-long projects, or they can be small as a "group think" activity akin to a fifteen-minute group brainstorm in a traditional class.

Closing Remarks

The motivational principles represented here are essential to success in online learning. Instructors should look for points where they can comfortably address these principles within their course design. The important point is the motivational principles themselves; the activities are simply vehicles through which motivation and learning can take place. The activities presented in this paper are not intended to be exhaustive in terms of their exemplification of how to motivate online students, but rather to provide examples and ideas to be adopted and adapted by online instructors in higher education and business learning environments. Most of these activities may be adapted to accommodate either synchronous or asynchronous communication technologies and may be used across disciplines.

Biographical Sketches

Dr. Curtis J. Bonk is a former CPA and corporate controller who is now an associate professor in the Departments of Counseling and Educational Psychology as well as Instructional Systems Technology at Indiana University (IU). He also is a core member of the Center for Research on Learning and Technology. He received the Burton Gorman teaching award in 1999 and was the first recipient of the Wilbert Hites Mentoring Award in 2000. During the past few years, he has been a visiting scholar in Finland, Canada, and Australia. Curt is currently a Senior Consortium Research Fellow with the Army Research Institute. He has also developed unique international conferencing exchanges and mentoring programs, including "The Intraplanetary Teacher Learning Exchange" (TITLE) and the "Teacher Institute for Curriculum Knowledge about the Integration of Technology" (TICKIT). His 1998 book with Lawrence Erlbaum, "Electronic Collaborators Learner-Centered Technologies for Literacy, Apprenticeship, and Discourse" has received many positive reviews. Dr. Bonk has presented his ideas at hundreds of state, national, and international conferences and seminars (e.g., Online Learning, Ed Media, Teaching in Higher Education, e-learning, Telecon, TeleLearning, AERA, and the Wisconsin Distance Teaching and Learning Conference) and is in demand as a conference keynote speaker. He is President of CourseShare.com, which he founded in 1999. He can be reached via e-mail at cjbonk@indiana.edu and his homepage is http://php.indiana.edu/~cjbonk. Curt holds a Ph.D. and M.S. in educational psychology from the University of Wisconsin-Madison, and a B.A. in accounting from the University of Wisconsin-Whitewater.

Address: School of Education: Room 4022
Dept. of Counseling and Educational Psychology
Bloomington, IN 47405-1006
E-mail: CJBonk@indiana.edu
URL: http://php.indiana.edu/~cjbonk
Phone: (812) 856-8353 (work)
Fax: (812) 856-8333

Vanessa Paz Dennen, Ph.D. is an assistant professor of Educational Technology at San Diego State University. She teaches both traditional and distance education courses, with extensive use of Web-based conferencing in both formats. She has been researching online instruction and teaching online since 1997, and works with other faculty in designing learning activities and promoting online collaboration among learners in their Web-based courses. Her research interests include computer-mediated communication patterns, and the design of Web-based learning environments. She works as an online instructional design consultant for CourseShare.com. Vanessa has presented at many conferences during the past few years including the American Educational Research Association Conference, Wisconsin Distance Teaching and Learning Conference, and Online Learning 2000. She can be reached via the Internet at vdennen@mail.sdsu.edu or vdennen@earthlink.com and her personal homepage is located at http://edweb.sdsu.edu/people/vdennen. She holds a Ph.D. in Instructional Systems Technology and an MS in Educational Psychology from Indiana University, and an MS in Instructional Design, Development and Evaluation from Syracuse University

Address: Dept. of Educational Technology
San Diego State University
5500 Campanile Dr, MC 1182
San Diego, CA 92182
E-mail: vdennen@mail.sdsu.edu
URL: http://edweb.sdsu.edu/people/vdennen
Phone: (619) 594-1861

Administering Successful Higher Education Distance Programs

Peter S. Cookson, Ph.D.
Director, Institute for Research in Distance and Open Learning and
Professor, Distance Education, Athabasca University

Mohamed Ally, Ph.D.
Associate Professor, Athabasca University

Luis Galarza, Ed.D.
Assistant Professor and Director of Distance Education, DePaul University

Given the current fascination with the worldwide expansion and seemingly limitless possibilities of the Internet for delivery of online courses and degrees any time anywhere, higher education institutions are scrambling to create and/or expand their distance education programming. The distance education literature is replete with "show and tell" accounts of instructors and institutions that have embraced the online learning and distance teaching environment as well as for newcomers yet to join the currently fashionable bandwagon. Less frequent attention has been given, however, to the challenges faced by higher education administrators who are responsible for managing distance education programs. Our assumption is that unless higher education administrators understand such challenges, they will be hampered in their efforts to make distance education a stable and viable component of the overall mix of services offered by their respective higher education institutions. In this workshop we address institutional challenges and corresponding administrative responses that arise from an institution's decision to create and/or expand distance education programming.

Institutional Challenges and Administrative Responses

The sections that follow will describe ten challenges and for each one, a variety of administrative responses will be explained. Examples will be drawn from the literature and from experiences of workshop participants.

1. Dysfunctional institutional orientation toward change

Administrators of distance education institutions face many challenges when administering distance education programs. Distance education institutions must think ahead and respond to changes to keep ahead of the competition and anticipated growth. According to Ackoff (1981, cited in Banathy, 1996), institutions may be said to exhibit one of four orientations. The *reactive orientation*, represented by the motto "back to the future," calls for a predominant emphasis given to preserving the ways that have become part of the institutional history. Characterized by top down structures, such institutions are highly resistant and incapable of responding to change. The *inactivist orientation*, represented by the motto "don't rock the boat," calls for maintenance of the status quo while masking such efforts by the creation of numerous committees to examine and reexamine issues, resulting in information overload, inconsistent information, and resultant inactivity. The *preactivist orientation*, represented by the motto "rise with the tide," recognizes the need to change but insists changes will be made when absolutely necessary and not before. Members of the institution go with the flow, anticipating and predicting changes and responding to changes when necessary to position the institution for growth. The *interactivist orientation*, represented by the motto "shoot the rapids," draws on principles of systems design to envision the ideal future state and then to exercise self-regulation and coevolution with the environment to direct and manage change required to attain the ideal future state (Banathy, 1992). With input from across the institution and with the aim of having the institution adopt a interactivist orientation, higher education administrators can initiate and oversee a strategic planning process.

2. Lack of motivation on the part of instructional staff to become involved in distance education

Given nine centuries of traditional higher education instruction inside campus-based classrooms, it is not surprising that many institutional staff members, as well as their academic units, are resistant to the instructional and administrative innovations required for creation and/or expansion of distance education programs. They view involvement with distance education as a costly distraction from other priorities. To overcome this challenge of lack of motivation, administrators can respond by providing staff development and training, implement recognition programs, establish promotion strategies, establish policies that resolve intellectual property issues, and institute procedures for revenue sharing with academic units.

3. An incomplete conceptualization of distance education and lack of integrated systems of distance education

Advancement of distance education programming in some institutions is hampered by an incomplete conceptualization of distance education. In their rush to adopt web-based teaching, many institutions fail to recognize that dual mode status will never be attained by merely permitting faculty members to transfer their classroom-based courses to the Web. While the "cottage industry" or "Lone Ranger" approach may enable students to access meaningful instruction in the short term, it is unlikely that it will result in stable distance education programming over the long term. Without a fuller understanding of the field of distance education, institutions will place higher priority on applications of educational technology than on such educational considerations as which methods correspond most effectively to the characteristics of the learners, the learning objectives, and what conditions should influence teaching and learning interactions. A result may be routine underestimation of the actual logistical, time, and financial costs of mounting quality distance education programs. Services essential to serve both distance education students and faculty members will remain fragmented and underdeveloped. Few, if any, mechanisms will be in place to enable orderly growth and development of the institution's distance education programs.

To respond to this challenge, and in order for distance education programming to become an established part of the institutional mission, administrators must oversee administrative and institutional reforms and a program of training and professional development will permit construction of regulatory, logistical, technological, course, and student subsystems (Kaye, 1981) either complementary or parallel to campus-based subsystems.

4. Lack of a financial structure that permit growth and expansion of distance education programs

One of the most serious challenges facing administrators intent on establishing distance education, as a vital part of the overall operation of their respective institutions is the lack of financing. As a result, programs can tend to be created in a hit or miss, ad hoc fashion. Programs that correspond to the funding priorities of government departments or other external funders tend to be funded for specific groups, for specific time periods. When funds are not renewed, such programs can rapidly disappear. Likewise, without an institutional funding base, programs will be overly reliant for success upon the limited discretionary time and enthusiasm of individual faculty who may, in the absence of additional incentives, eventually succumb to burnout. To respond to this challenge, administrators may need to initiate a realignment of budget priorities as well as to set in motion procedures for a self-financing scheme that provides acceptable levels of compensation for faculty members, their academic units, and sufficient revenue for up front "venture capital" to fund innovations with a high probability of financial and as well as academic success.

5. Increased competition

While many campus-based universities have been slow to respond to the increased demand for more flexible learning, many new institutions and consortia have entered the market and begun to compete with those traditional higher education providers. No longer are campus-based institutions assured of unquestioning loyalty of residents within their traditional catchment areas. Where formerly residents were limited in their choices to whatever local campus-based institutions offered, they are now offered limitless choices by many institutions, many of them in far off places and but with highly prestigious names. Direct competition is now an undeniable condition for campus-based institutions. Aware of the need have their institutions become more competitive, administrators will not be content to organize single and unrelated courses in a variety of subject areas. Rather, they will be intent on identifying fields of study in which high demand whole certificates, diplomas and both undergraduate and graduate degrees may be offered through distance education. Revision of existing campus-based educational programs will most certainly be required but such is the price to take on and beat the competition. A particularly effective way to overcome the competition is suggested by the phrase, "If you can't beat'em, join'em!" This option involves teaming up with strategically selected partner institutions leverage such inter-institutional collaborative arrangements as *articulation, learning centres, development, delivery, consortia,* and *full integration* (Davis, 2000).

6. Inadequate internal resolution of competing internal stakeholder interests

Institutions may be viewed as collections of competing and often conflicting interest groups and stakeholders. In many institutions, distance education is a fiercely contested phenomenon for which there are often divided proponent and opponent camps. When operational subsystems are created in dual mode institutions to serve distance education students, not surprisingly they often encounter opposition from other subsystems within the institution that do not share that commitment. Even in those cases where a central administration of a conventional dual mode institution proclaims distance education programming as an institutional priority, co-existence among distance education subsystems and conventional education subsystems can be strained. With non-distance education priorities carrying the heavier weight of institutional history and tradition, they can easily trump distance education initiatives. To meet this challenge head on, administrators will need to exercise effective institutional leadership, enabling the institution to engage in institution-wide collaborative strategic planning, construction of essential distance education subsystems, and institution wide staff development and training.

7. Lack of technological infrastructure

Impeding the advancement of distance education in many institutions is the lack of an adequate technological infrastructure. Examples of problems arising from a lack of technological infrastructure include reliance on proprietary and commercial software, inadequate technical support, non-standardization of hardware and support, lack of hardware and software to adequately access course materials. Because it is already in place or because the funds are available to purchase it, sometimes an institution will decide to adopt or continue use of specific technologies -- even when such use may not be in the best interests of either the learners or the institution. Even when such use cannot be justified given the enormous institution-incurred equipment maintenance and operation costs and the individual learner-incurred costs of travel to a central or remote site to participate, certain technologies may continue to be favored over more cost-effective and more learning-effective technologies.

Such problems may be avoided by development of an institution-wide strategic plan that includes a strategic technology plan. Such a master plan could allow for systematic analysis of the full range of distance education methods instructors, taking into account the different contexts of deployment. Additionally it would address the issue of coordinated acquisition of software and hardware within a three-year time frame.

8. Lack of a marketing stance

As the world becomes smaller and prospective students are presented with more options for formal study, formerly stable environments in which universities operate have become highly volatile. With little competition, a seemingly never-ending supply of students, and a stable supply of government funding, campus-based institutions did not preoccupy themselves with marketing. In fact, traditional institutions have generally looked askance at the concept of marketing, associating it with crass commercialism and regarding it as incompatible with the intellectual, cultural, and spiritual purposes of higher education. Yet this institutional orientation leads institutions to expect students to make whatever adjustments are required to accommodate the operations of the institution. Unwilling to look beyond their current major "customer base" of campus-bound students, institutions concentrate on meeting their own interests rather than interests of students. As new programs are created to serve new groups of under-served and unserved students, administrators who face this challenge to dual mode status must work with individuals and administrative units to shift from an *institutional orientation* to a *marketing orientation*. Such a shift involves a commitment to provide higher quality of service in order for the institution to accommodate the interests and needs of students.

9. Absence of quality assurance measures

Because faculty members and institutions are still relatively unfamiliar with course design, development, and delivery in online and other distance education settings, instructional and program deficiencies may be magnified. To ensure adherence to the highest quality standards, administrators can put into place systems of quality assurance comprising ongoing formative evaluation at the stages of course design and course development, as well as course delivery. Administrators must put in place systems for monitoring the performance of the subsystems that collectively comprise the distance education system. Problems can be resolved at the time or shortly after they arise, thus minimizing the potential harm. Administrators may also establish provision for program evaluation at regular intervals as well as a system of benchmarking. Inglis, Ling, and Joosten (1999) described the following ten principles for implementing and assessing delivery of instruction (p. 161).

- Informed planning and management of resources
- Sustained committed leadership
- Improving access for all clients, incorporating equity and promoting cultural diversity
- Understanding the requirements of the learner and reflecting stakeholder requirements
- The design, development, and implementation of programs for effective and active learning
- Creating confident and committed staff with new competencies
- Managing and maintaining the technical infrastructure
- Evaluating for continuous improvements
- Providing effective and efficient administrative systems and services
- Supporting the needs of learners

The challenge for administrators is to develop and implement the indicators of best practice to effectively evaluate and improve the distance education system.

10. Lack of prepared staff

As higher education institutions around the world wrestle with the challenge of initiating or expanding their involvement with distance education programming, many administrators and faculty members are skeptical about the purported benefits of distance education. This skepticism is reflective from an accurate assessment of issues yet to be resolved within the institution, a lack of knowledge, skills, and sensitivities required for competent performance in distance education, and a fear of the unknown. Unless these issues are addressed and resolved, it is doubtful that lasting progress will be made. Clearly, administrators must initiate and oversee a program of staff development. A central unit charged with the responsibility to promote and coordinate distance education efforts throughout the institution can mount professional development and training programs can go a long way to removing misconceptions that underlie the belief that certain methods must be adhered to regardless of their relative effectiveness and timeliness. That same unit can initiate a program of publicity and recognition for courses and programs that exemplify best practice. Star performers and outstanding courses and programs can be featured in university-wide events. Too, the same unit can sponsor comparative research of various distance education methods, the results of which can be used to disseminate information and form favorable attitudes toward the full range of distance education methods. To encourage experimentation, such a program may utilize a variety of methods to increase understanding of the nature of distance education: individual and group consultations, courses, workshops, printed material-based and web-based self-directed educational programs and resources, educational lunch time seminars, user groups, and subsidies for instructional technology applications.

Summary

This paper has reviewed some of the significant challenges facing higher distance education administrators. As suggested by the first challenge of a less than optimal institutional orientation toward change, underpinning an institution's entire effort to transform itself into a dual mode institution is that institution's orientation to change. If the political will exists to envision an ideal future that takes into account the changing external context, such a future envisioning project can produce, with input from individual faculty members and academic and administrative unit stakeholders at all levels, a widely supported institutional distance education strategic plan. That plan can become the blueprint for implementation of effective distance education programs and their incorporation into the normal operations of a dual mode institution.

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Biographical Sketches

Peter Cookson is Director, Institute for Research in Distance and Open Learning and Editor, *International Review of Research in Open and Distance Learning* [www.irrodl.org.]

Address: Athabasca University
1 University Drive
Athabasca, AB T9S 2B2 Canada.
E-mail: peterc@athabascau.ca.

Mohamed Ally is Associate Professor in the Master of Distance Education Program.

Address: Athabasca University
1 University Drive
Athabasca, Alberta, T9S 2B2, Canada
E-mail: mohameda@athabascau.ca.

Luis Galarza is Assistant Professor and Director of Distance Education in the School of New Learning at DePaul University.

Address: DePaul University
25 E. Jackson Blvd.
Chicago, IL, 60604 USA.
E-mail: lgalarza@depaul.edu.

Designing Learning Marketspace Partnerships

Ann Hill Duin, Ph.D.
Associate Provost and Director
Continuing Education and Communication Services
Iowa State University

Linda L. Baer, Ph.D.
Sr. Vice Chancellor for Academic and Student Affairs
Minnesota State Colleges and Universities

Partnering is an important way to expand an organization's limited resources in order to meet the complex needs and the potential that exists in the global e-learning environment. Successful partnerships are smart partnerships whether they join distant competitors or close allies or involve inter-institutional cooperatives or public-private arrangements. This workshop offers a 'partnership compass' to guide participants through the 'e-cology' of digital partnerships, determining the type of alliance that best fits their needs, organizing the structure of a partnership within their organization, and locating the resources that support their learners. Presenters also discuss how to sustain a successful partnership once venture capital, legislative funding, or other external start-up support is gone.

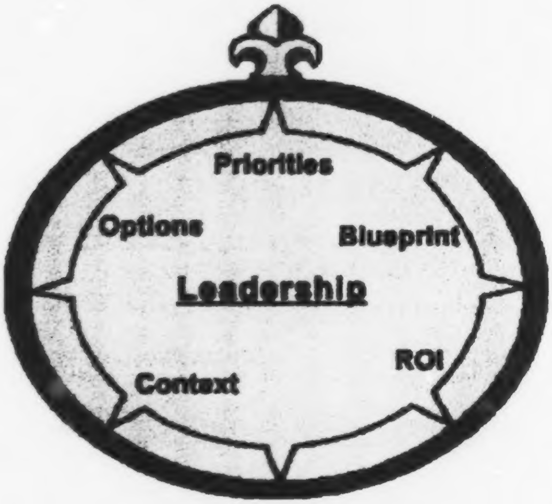

Figure 1. The Partnership Compass.

We define the learning marketspace as "a gateway through which learners, employers, and learning providers are drawn together into a dynamic Internet based marketplace that creates value for learners, enhances economic development, and engages institutions in meeting the needs of 21st century learners" (Duin, Baer, and Starke-Meyerring, 2001).

When established institutions embark on a learning marketspace partnership, stakeholders' emotional reactions vary. Some are tremendously excited because they recognize the institution's need to partner in order to develop online programs and resources for learners. Other stakeholders genuinely fear that online

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resources resulting from partnerships represent a second-class form of learning and student services. A third group of stakeholders are suspicious, believing such partnerships are just the next ineffective educational scheme, competition for scarce resources, additional burden without reward, a top-down decision forced upon them, or simply another nuisance keeping them from conducting research or other activities.

This workshop documents, through in-depth case studies, the factors present in successful partnerships, and the benefits gained from such initiatives. Those attending will emerge with a greater understanding of how to structure a "smart" partnership – internally in their institutions as well as externally with the partnership entities – to meet the need for relevance, speed, and sustainability.

This session will be of great interest to faculty, students, administrators, policy developers, as well as industry, community and government leaders as all are or will be heavily involved in developing inter-institutional and public-private partnerships and their accompanying portals.

Context, or the "e-cology" of Digital Partnerships

As society increasingly inhabits digital spaces in addition to physical places, the higher education environment undergoes fundamental change. To a large extent, these changes occur because networked digital spaces exhibit different dynamics, dimensions, and characteristics than do physical places. For example, while physical places have three dimensions, digital spaces are unlimited in their dimensions, connections, and relationships. In such spaces, different entities, such as people, agents, objects, technologies, and information relate to each other in unlimited numbers and ways. With this capacity, digital spaces allow for the nearly instant aggregation of mega-structures called portal technologies, which command the lion's share of traffic in these spaces. According to Lada Adamic and Bernardo Huberman, digital spaces thus follow what they call a "universal power law," resulting in a winner-take-all environment.

As the Nielsen/ Netrating Report for Internet year 1999 shows, 1999 is the year in which this winner-take-all environment manifested itself on the Internet. According to this report, Internet users spent more time online but visited fewer sites—at first sight a seemingly trivial observation. However, a closer look reveals that, consistent with the winner-take-all nature of digital spaces, the Internet is being structured into few but large mega-portals, such as Yahoo!, leaving little Internet traffic for small individual sites. To use the familiar frontier analogy, we might say that the digital space of the Internet is moving from its initial "homesteading" phase into an aggregation, "urbanization," or marketspace phase.

These dynamics present an institution with three choices for positioning itself in digital space: (1) stay at its homestead with its own individual home page; (2) pay "rent" for a space in someone else's learning marketspace; or (3) partner to build a learning marketspace. In this paper, we address the third choice—partnering to build a learning marketspace.

Options and Priorities, or Determining the Type of Alliance That Best Fits the Needs

A number of institutions have entered this partnership arena with plans to transform learning through new forms of service, responsiveness, and innovation. However, some of these learning marketspace partnerships appear to be successful (e.g., Unext.com, SREC.edu, KYVU.org, IowaCConline.org), fledging (e.g., Fathom.com, NBU.com, MnVU.org), or somewhat unsuccessful (e.g., Hungryminds.com), which leads us to ask the following questions:

- Success: What equals success in learning marketspace partnerships?
- Structure: How are successful learning marketspace partnerships organized?
- Speed and Scalability: How much are speed and scaling factors of success?
- Sustainability: Once the venture capital or legislative funding is gone, how are successful partnerships sustained?

Blueprint, or Organizing the Structure of a Partnership Within the Organizations

As part of the workshop, we present a set of six case studies that illustrate successful, fledging, and unsuccessful learning marketspace partnerships. From these case studies, we extract success factors for "smart" partnerships.

To develop each case study, we drew on the work of Robinson and Daigle who present a conceptual framework for gauging institutional readiness for public-private partnership development. Their framework integrates an action context (descriptive-explanatory, normative, assumptive, and instrumental actions) with a developmental sequence (vision → commitment → culture → risk → power → adaptability). The following set of questions is our synthesis of their framework: it is a series of steps and corresponding set of framing questions that we use both as an initial blueprint for partnering in the learning marketspace and as a set of questions for analyzing current partnership efforts.

- Description: What is it (i.e., the partnership)? How will it affect my institution?
- Beliefs: What are the guiding, foundational principles?
- Assumptions: What can my institution assume that we can achieve together from this partnership? What will each partner do or be responsible for?
- Operations: How will it work? Is it feasible?
- Vision: What is the greater vision or greater social good?
- Commitment: Are multiple levels committed to it? Are levels of trust and covenants in place?
- Collaboration: Are collaboration and cooperation more important than hierarchy and competition?
- Risk: Can we tolerate the financial, legal, academic, and/or experimentation risks?
- Control: Who has the authority? Where are clear lines drawn?
- Adaptation: Are we willing to alter the direction, structure, and operations to support the partnership?

As part of this workshop, we present a "scenario" and poll the audience as to whether or not they would engage in such a partnership. We then present a brief analysis of the partnership according to the above set of questions, followed by an analysis of the partnership's structure, speed of development and scalability, and means for sustaining itself.

Return on Investment, or Sustaining a Partnership Once Venture Capital, Legislative Funding, or Other External Support Is Gone

Together, these six case studies point to clear themes regarding what makes a "smart" learning marketspace partnership. No amount of venture capital as yet has replaced the need for a greater vision or greater social good. No legislative mandate has yet resulted in an altering of direction, structure, and operations on the part of established universities to support a learning marketspace partnership. Instead, success factors include decision makers in full support of the partnership (see "Level 5 Leadership" by Jim

Collins, *HBR*, Jan. 2001), a willingness to foster what Clayton Christensen calls a "disruptive technology" through either embedding or building (vs. bolting on) the learning marketspace partnership, and proactively addressing the financial, legal, academic, and experimentation risks.

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Biographhical Sketches

Ann Hill Duin is Associate Provost and Director of Continuing Education and Communication Serivces at Iowa State University where she leads distance education efforts and promotes and facilitates learning marketspace partnerships and integrated investment strategies. Hill Duin's over 60 publications include books and journal articles on the design of online learning environments, collaboration, usability testing, and distance education research. She works with state and national organizations to provide citizens with better access to post-secondary instruction and other services made available by partner institutions and businesses

Address: 102 Scheman Building
Iowa State University
Ames, IA 50011-1112
E-mail: ahduin@iastate.edu
URL: www.lifelearner.iastate.edu
Phone: (515) 294-4803
Fax: (515) 294-6223

Linda L. Baer is Senior Vice Chancellor for Academic and Student Affairs at the Minnesota State colleges and Universities system. Baer has regularly assumed leadership roles in the state in instructional technology, bridging colleges and universities with the workplace, assessment and accountability and educational transformation. Dr. Baer has served in numerous offices in professional organizations and regional societies. She serves on the Kellogg Foundation Forum for Higher Education Transformation, the Midwest Higher Education Commission steering committee for the Distributed Learning Workshop, and was on the Association of American Colleges and Universities committee that produced Facing Change: Building the Faculty of the Future.

Address: 500 World Trade Center
Minnesota State Colleges and Universities
30 East 7th St.
St. Paul, MN 55101
E-mail: linda.baer@so.mnscu.edu
Phone: (651) 296-0540

Reach Them All From A Distance: Accessibility Issues and Distance Education

Melanie Hounshell, Library Media Specialist
Center for Disability Information and Referral
Indiana Institute on Disability and Community
Indiana University, Bloomington

Marilyn Irwin, Center Director
Center for Disability Information and Referral

Distance education is the ideal forum for those who, for one reason or another, prefer to have education brought to them. For most people with disabilities, the reasons equal those of the general population – convenience, cost effectiveness, work schedules, and family commitments. For some, however, distance education may be the only way they can access educational offerings.

This paper will provide a rationale for providing accessible distance education, present accommodations that can be made, and discuss various applications of educational and assistive technology to support the needs of people with disabilities in distance education. Because much has already been said and written about Internet accessibility, the authors will focus on videoconference and teleconference technologies.

Rationale

Due to advances in medicine and better methods of diagnosis and identification, the number of people with disabilities is increasing. "The number of students with disabilities [ages 6 through 21] served under IDEA [the Individuals with Disabilities Education Act] continues to grow at a greater rate than both the resident population and school enrollment." (U.S. Department of Education 2000, p. XXXIII). Between 1987-88 and 1998-99 (the most recent data available), there was a more than 36 percent increase in the number of students served by K-12 education programs. (U.S. Department of Education 2000, p. A-49). In higher education, "one in 11 first-time, full-time freshmen entering college in 1998 self-reported a disability." (Henderson 1999). The numbers indicate that the educational needs of students with disabilities cannot be ignored, and they identify a vast market for distance education opportunities.

In addition to the numbers, there are numerous state and federal laws that mandate equal access to education for students with disabilities. Section 504 of the Rehabilitation Act of 1973 requires all education programs receiving federal funds be accessible to students with disabilities. The Americans with Disabilities Act (ADA) extends coverage of Section 504 to the entire nation and mandates the development of a plan of compliance by every institution receiving federal funds. The Individuals with Disabilities Education Act assures "the free appropriate public education of all children with disabilities" between the ages of three and 21 and specifies the provision of assistive technology devices and services. Taken together, every educational institution must make accommodations for students with disabilities so they can access educational programs.

Accommodations for People with Disabilities

Accommodations come in many forms, vary widely in price, and may involve a range of assistive technology. The Individuals with Disabilities Education Act (IDEA) defines an assistive technology device is "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities." Assistive technology devices can be divided into two categories, high tech and low tech. Using the IDEA definition, many types of educational technology that already exist in the classroom (e.g., tape recorders, overhead projectors) may also be considered assistive technology.

Low tech devices usually include non-electronic items and are relatively low in cost. These devices are so numerous that they can include items as diverse as pencil grips, adjustable height tables and podiums, velcro, book holders, page turners, and simply enlarging the font size for any documents presented.

High tech devices encompass the computer and electronic items, and they are typically more expensive than low tech devices. There is a wide range of high tech devices available to people with disabilities now, and the market is continually expanding. Some examples of high tech include text telephone (TTY) and the Telecommunications Relay Service (TRS), braille and voice output computer devices, electronic door openers, voice input technology, real-time captioning, and descriptive video. The TTY and TRS provide text-based access to telephone communication for people with hearing and speech related disabilities. Real-time captioning is a process where transcribers use steno machines to instantly capture what is being said in class and create text so hearing impaired students can read it. Students who have visual impairments will require verbal delivery of visual materials presented, including descriptive narration of materials on video that are not provided in other formats.

If it meets the needs of the students, standard educational technology can also be used as assistive technology. Overhead projectors and document cameras, for example, can provide written presentation of verbal information to support the needs of students with hearing impairments. The projected image can also be enlarged for students with visual impairments, and the use of audio and video presentation can help focus students with attention deficit disorder, learning disabilities, or behavior disorders.

Special Considerations for Distance Learning Events

The success of distance learning programs can be measured by the on- and off-site administration and management of technology logistics, equipment, and the methods used to present the content material. Success may also be measured by the indicated preferences of the participants and the provider's ability to meet the needs specified. Being prepared with several solid backup presentation and technology plans can limit technical difficulties without nixing the entire program. For instance, audio conferencing equipment might be on-hand at the origination site to be used if the video connection fails. Why not a backup Plan D for disability accommodations?

Plan D

When implementing distance learning programs to meet the needs of people with disabilities, consider adding a Plan D to the event logistics to allow for additional room layouts and technology set-ups when needed. Plan D should include components that answer the following questions: How should a determination be made for selecting the level of accommodations to be made? Whose responsibility is it to meet the needs of people with disabilities participating in a distance learning event? How will the needs of people with disabilities affect the distance learning event being planned? How physically accessible are the distance learning origination and remote site facilities? Will a person with a disability be presenting material to the other sites? Will there be people in the audience with cognitive, hearing, learning, physical, or vision impairments? Can print material be provided in alternative formats?

Planning and providing barrier-free accessible distance learning events to meet the needs of people with disabilities is critical to the success of reaching those who wish to participate in distance learning education. People with differing types of disabilities may not perceive distance learning programs as a viable means of receiving content, training, or education if they think that the programs are not accessible to people with their particular type of disability. If people encounter numerous barriers while trying to access information via distance learning, they will be reluctant to pursue that avenue in the future.

Educational and assistive technology can facilitate the accessibility of program content in distance education environments when needed and planned for appropriately. Distance education utilizes alternative media formats to provide course and workshop content to learners at onsite and remote locations. In order to provide quality accessible distance education programming, some foresight, thought, planning, preparation, and knowledge of the needs of people with disabilities are necessary to obtain a successful outcome. Plan D could become an integral part of the planning process for each distance learning event and any or all portions used when needed. Some special considerations for providing accessible distance learning events are listed below.

The Level of Accommodations

Distance learning events can generally be categorized into one of two categories. The event will either be an open, public event with no advance registration or a closed or invited event with advance registration.

According to legal guidelines, a distance learning event provider is not obligated for spur of the moment requests for accessibility options during open, public events; however, the provider should attempt to provide access if the request is reasonable and doable in a timely manner. It is always a good rule of thumb, however, to make every attempt to provide the necessary accommodations if it is feasible to do so.

A provider must provide reasonable accommodations for any specific requests indicated on registration forms submitted prior to the event. Additional accommodations are not required if a request by the individual with a disability was not made in advance of the event date; however, the provider can offer to produce alternative materials to be disseminated at a later time.

Note: According to legal guidelines, a person with a disability does have a responsibility to notify the agency or provider in advance of an event if there are special needs.

Suggested Responsibilities

In addition to an event coordinator's regular duties (e.g., scheduling facilities, speakers, food), the coordinator could be responsible for collecting special needs information on participants and notifying site and content presenter(s) of any needs for special accommodations. The coordinator also provides any marketing and registration materials related to coordinating the event in alternative formats as needed. The event coordinator may work with on- and off-site coordinators and presenters to coordinate special communication accommodations for pre, post, and event day activities.

Origination and remote site coordinators, in addition to regular distance learning setups, can help coordinate and facilitate requests for special room layouts and technology accommodation set-ups to facilitate dissemination of event content and communication via technology for their respective sites. They work with on-site technicians to see that accommodations utilizing existing or additional technology and assistive technology are operating properly for the event.

On-site technicians are the people called and relied upon to set-up, operate, train (when needed), and perform trouble-shooting on all types of distance learning technology during real-time events. This may mean that the technicians are also called upon to set-up, train, operate, and/or troubleshoot assistive technology during a distance learning event.

Generally, the presenter(s) is responsible for providing any accompanying presentation materials in alternative formats for distribution to participants if notified in advance of the need to do so. An event or site coordinator may or may not be a presenter but could assist the presenter(s) to prepare alternative materials, if they choose to do so. All coordinators and presenters have the option of contacting local, regional, state or federal Americans with Disabilities Act (ADA) specialists to interpret the level of accommodations and what constitutes reasonable access under the law.

Affect of Accommodations

If proper planning and selection of assistive technology is adhered to, the provision of accommodations to meet the needs of individual people with disabilities should not hinder the distance learning event itself. Oftentimes, providing accommodations such as captioning, adjusted lighting, and rearranged seating assists the event audience in general and does not affect the intended outcomes.

Physical and Content Access Barriers

Sometimes small things do not seem to be a barrier to those of us who do not have disabilities of any type; however, some small things could be major hurdles for people with disabilities. For example, electric wires lying on the floor to connect equipment may prevent someone using a wheelchair from moving freely around the room, especially if this person happens to be the presenter for the event! Find out ahead of time if accommodations are going to be needed at each site and what type of disability the person requesting the accommodations has. Provide the accommodations to meet their preferences, if preferences were specified. If preferences were not specified, try to think like a person with a disability and evaluate the room and equipment set-ups and content materials to be provided at each site, then determine what accommodations can reasonably be made. Communication among the event and site coordinators, technicians, presenter(s), and people with disabilities is a must for successful accommodations to be made. Troubleshooting all connections and assistive technology equipment before the event would maximize the potential for success.

Alternative Formats for Multimedia Materials

Alternative formats for multimedia materials to be used for a distance learning event could come under one of two categories: real-time event materials and pre and post event supporting materials.

The coordinator(s) should collectively determine what type(s) of assistive technology will be needed at each site to support the real-time event materials. For example, does captioning need to be provided for audio being transmitted from both the origination and receiving sites, or for a video to be shown? Do the transparencies to be placed on the document camera need to be enlarged to a certain size for viewing? Who will troubleshoot the problems that may arise from adding this technology to the distance learning equipment set-up?

The coordinators or presenter(s) could opt to provide a sign-up sheet at the distance learning event for people with special needs to indicate their preference to receive the supporting materials in an alternative format. The coordinators should see that the participants receive their requested materials in a timely manner.

Communication

All coordinators and presenter(s) should keep in mind that providing accommodations during the real-time distance learning event is not the only time that accommodations may be needed. Accommodations may need to be made to facilitate communication among the presenter(s), participants, and coordinators before and after the event for pre and post event activities, and for communication about registration, scheduling, housing, food, and transportation needs. It would be beneficial to all event coordinators and participants if the accommodations needed are outlined early on in the event planning stages, including providing a number of communication channels such as phone numbers for TTY and fax and addresses for e-mail and snail mail (postal). All site coordinators should have this information for their own sites and other sites before the event.

In conclusion, you must remember that each person with a disability is a person with individual needs. Accommodations made for one person with a physical disability may not work for another, for example. The best rule of thumb for any presentation is to know your audience, and this rule particularly applies with people with disabilities. The second rule is that stuff happens. Most people are sympathetic, and your best intentions will often compensate for any difficulties that may arise.

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Biographical Sketches

Melanie Hounshell, Library Media Specialist for the Center for Disability Information & Referral (CeDIR), earned a BA in Elementary Education and an MS in Educational Media, both from Indiana State University. She is responsible for media materials production, the Institute's distance learning and multimedia conference rooms, and designing and maintaining CeDIR's Web pages. Melanie is currently coordinating two research projects related to providing accommodations in distance learning for K-12 and higher education students.

Address: Indiana Institute on Disability and Community
2853 East Tenth Street
Bloomington, IN 47408-2696
E-mail: mhounshe@indiana.edu
URL: www.iidc.indiana.edu
Phone: (812) 855-6508
Fax: (812) 855-9630

Marilyn Irwin, Director of CeDIR, has extensive educational and experiential background in information services. She earned a Masters in Library Science (MLS) and Ph.D. in library science, both from Indiana University. Marilyn has provided training and coursework on access to disability-related information, and she is currently investigating information delivery systems through the use of technology.

Address: Indiana Institute on Disability and Community
2853 East Tenth Street
Bloomington, IN 47408-2696
E-mail: irwinm@indiana.edu

Video Streaming Applications in Training and Education

Sandra C. Robin, PhD, LISW
Associate Director, Center for Advanced Studies in Child Welfare
University of Minnesota, Twin Cities

Richard Reardon
Principal Media Producer, University Media Resources
University of Minnesota, Twin Cities

Billie V Strand
Media Production Supervisor, University Media Resources
University of Minnesota, Twin Cities

Video streaming is a delivery method that combines videoconferencing and the internet. A live or recorded event can be distributed over the internet. The audience for the event participates by connecting to the stream, usually via a Web page link. "Streaming technology basically compresses the audio/video signal, breaks that compressed signal into discrete data packets, and sends these packets over the network to a special player which reassembles the packets to simulate a continuous audio/video stream" (Frequently Asked Questions, 2000, p. 2). "Simply stated, streaming refers to the process of delivering audio clips, video clips, or other media presentations in real time to on-line users. A clip can be viewed or heard almost immediately as it downloads from the streaming server; users do not have to wait until it is completely downloaded before playing it back on their computers. Streaming can be live or non-live. Webcasting generally refers to live streaming" (Dupagne, 2000, p. 4). An advantage of using a true streaming file format like Real Video is that the incoming file does not download onto the computer's hard drive as it is being received. Thus there is no data that needs to be stored, or take up local computer hard drive space.

Video streaming or Webcasting as a delivery method allows people across the country and around the world access to an event, if they have the requisite computer equipment. A limitation on the adoption of video streaming as an educational delivery method is the fact that "Currently, fewer than three percent of the country has access to the high-speed broadband technologies needed to view streaming video without interruption" (Krebs, 2000). Nonetheless, an increasing number of colleges and universities are considering investing in video streaming technology for use in distance education, as well as for use in other Web based broadcasts (Dupagne, 2000).

A Video Streaming Pilot Project – University of Minnesota

In April of 2000 (the pilot was duplicated in April of 2001) the Center for Advanced Studies in Child Welfare in the School of Social Work, University of Minnesota offered a satellite videoconference aimed at improving social work practice with children who enter the child welfare system at a very young age.

Media production experts from the department of Distance Education/University Media Resources at the University of Minnesota were contacted to provide the production support needed to produce the videoconference. The Media Resources staff had been researching video streaming and suggested that a concurrent live video stream would be a good opportunity to test the delivery of high-quality audio and video via the internet. The addition of the video streaming expanded the reach of the satellite videoconference to interested colleagues across the country.

A summary of the video streaming pilot project is presented from the perspectives of both the media resources side (the technical aspects) and the social work side (the training/education aspects).

Pilot Project Rationale

Media resources. The Distance Education/University Media Resources department was anxious to test the viability of concurrently or synchronously "streaming" a live satellite videoconference. Streaming video on the internet presents another medium of distribution for clients, and a very economical one. Since resources have already been invested for production and satellite distribution, providing an internet "stream" of a videoconference event is effective, inexpensive and "value-added". Also, the Social Work videoconference involved minimal screen motion (the content was largely talking heads), which made it ideal for the video compression that is part of internet streaming.

Social work. Although the video streaming was primarily an experiment that the media staff were pursuing, the School of Social Work saw this as an excellent chance to try out a new technology and use it as a vehicle to make the videoconference accessible to a wider audience. Since the Center was interested in receiving feedback on the use of a case consultation training format the opportunity to stream the videoconference live over the internet was seen as a way to get a response from colleagues nationally on this technique, as well as on video streaming as a delivery method.

Process

Media resources. To stream video, originating video is encoded into a digital format and then served onto the Internet, via a video server. The video server is software and/or hardware that optimizes the delivery of the video files. One also needs data connections among these devices. University Media Resources provided a video feed, which was produced with streaming in mind, which meant that the video elements were chosen to accommodate low bit rates (no zooms, no pans, etc. were used). The video feed was sent via campus cable to an encoder for analog to digital conversion. The encoder used is a hardware device, which converts video to a particular type of digital video file: Real Video. In the act of generating a Real Video file, the encoder also compresses that file to a size and datarate manageable for distribution over the internet to computers connecting at a variety of bandwidths—everything from a 28.8 modem to a high-speed local area network. Once encoded, the stream was fed over the campus network backbone to the Real Video Server at the University's Academic and Distributed Computing Center. This server sent the stream off-campus and onto the internet to anyone who connected to the streams Web address. To provide that connection, a Web page was constructed which identified the event, described the technology needed to receive the stream, set up a test to ensure that client software was working, solicited feedback, and, most importantly, provided a link to the stream. This link was made active about an hour before the event.

Social work. Online viewers were solicited through nationwide listservs. A month before the videoconference the project director put an email out on one statewide and three national listservs of social work educators, trainers, and deans and directors of schools and departments of social work. These postings announced the upcoming videoconference and invited people to participate, as the videoconference would be streamed live (synchronously) over the internet. Potential participants were alerted to the type of hardware and software they would need to be able to receive the streamed video. Several days prior to the videoconference a second posting was made to the same listservs advising potential participants of the URL, as well as the 800 number for call-in questions. A request was also made for evaluative feedback on the content and the process of the video streamed conference, and on the technical aspects of the video streaming.

Results

Media resources. The University of Minnesota Real Server has a sixty-stream license (the software allows sixty users to connect to a stream at once); some 25 users accessed the stream at some point in the two-hour videoconference. Accordingly, anyone who wanted to connect would not have been restricted by license bottlenecks (essentially a busy signal cutoff). While several respondents reported good internet reception for some of the videoconference they viewed, nearly all reported occurrences of network congestion and its accompanying artifacts. Usually, such congestion results in audio/video mis-synchronization. In these cases the audio would be of good quality but the video would be jerky, or the video would freeze while audio would continue. Some reported having their computer freeze, necessitating a restart (reboot) of the computer. Most reported that the quality varied over the two-hour period of the videoconference. It is impossible to determine if problems were due to the client computer, the local access points (network) or the longer data runs across country. Net congestion and buffering clearly affected many of these users. This is a common problem of national Webcasts, even for those with broadband reception. Often, these problems are localized (e.g., a local campus could experience network congestion that is especially constraining while another campus nearby has no such on-site congestion).

An entire industry has sprung up to service such events. These vendors position several "server farms" across the country as relay "boost" points for national Webcasts relieving congestion in the affected regions. Other strategies that have evolved include originating the Webcast at non-peak server times, avoiding early morning, noon and late afternoon. Providing an audio only feed (audio rarely experiences congestion, even at low bandwidths) can also alleviate these problems.

Social work. Approximately 500 people participated in the satellite videoconference across the State of Minnesota and in several counties in Wisconsin. The total number of people participating via video streaming is unknown. However, feedback on the video streaming was received via 20 email, representing at least 32 (one group of ten) people participating in Arkansas, California, Illinois, Maine, Michigan, Minnesota, Missouri, North Carolina, and Texas. We did not provide a form for these participants to complete. All video stream participant comments emailed were free form. The people participating via video streaming, who identified themselves by email, included: social work educators; trainers; administrators; staff development specialists; researchers; agency based field instructors; tribal social workers; and social work students. Six of these video streaming participants commented that seeing cases that represented child welfare issues from another state helped them, in the words of one respondent, "stay abreast of the issues nationwide, which are driving child welfare". Several also commented on liking the format, and that it was appropriate for the delivery method, "I liked the organization in which the social worker presented the case first and then the consultants responded". As a tool for training and education, one email respondent wrote, "I thought they (the cases) introduced some of the larger service, treatment, and decision-making issues that confront the child welfare field," while another said that it was "a good way to learn about what is happening in child welfare in a different part of the country." In addition, two email respondents said they appreciated the opportunity to participate in a conference in another state while sitting at their own desk. One video streaming participant wrote, "The fact that many people around the nation are able to view and participate in this event—at a reasonable price—is very important for the future of training." Eight of the video streaming participants who emailed feedback saw this as an opportunity to learn about a new delivery option for training and education and a model for distributing information.

Recommendations

Media resources. It would be best to keep events away from high traffic periods on servers (Server loads grow toward noon, and toward 4:00PM local times). This is admittedly difficult for a national feed because of the different time zones involved. It is also necessary to keep feed datarates low. The "LAN" rate served in this project was 230 kilobits per second. Serving at 150 kilobits may have provided smoother viewing at work sites. Additionally, it may be worth considering an audio-only feed as a choice. Audio feeds are almost trouble free on modern computers and would be recommended for those events having little visualization (until the technology will support video better).

While it is impossible to know the source of the various 'reception' problems experienced by some who 'tuned in' to the Internet stream, our default video window size of 320 pixels x 240 pixels may have contributed to faulty playback. A video window of this size is approximately one-quarter of some computer screens, and is quite large. In the future, we plan to restrict ourselves to a video window no larger than 240 pixels by 180 pixels. This smaller size could make a significant difference for some networks and computers."

To address the issue of the cost of satellite versus streaming, it might be tempting to imagine foregoing the satellite costs ($2075.00 for the uplink and transponder for the two-hour event), and use the Internet alone for distribution of such a video program. That may not be possible, or economical at the present time. At the University of Minnesota we are fortunate to have a streaming media provider on campus, whose rates of $100 an hour to encode and play the streaming video on the internet is extremely reasonable. Although the streaming services market has been estimated to grow into a $2.5 billion industry in a few years, such providers are currently located only in a few major metropolitan areas (Minneapolis has no commercial provider, for example), and their prices vary widely. A recent list of major vendors, and their prices for webcasting a fictional 20 minute presentation to 1,500 users indicates that prices vary by thousands of dollars. (Petrucha, 2000.)

More important than cost, at least for the near future, is the issue of reliability. Satellite broadcasting is an established, proven technology, with reception that does not vary when downlinked correctly. Internet webcasting is still in its infancy, and while promising, would be nonetheless risky as a sole means of program distribution.

Social work. Continuing the learning from a video streamed training effort could occur by creating an online chat room or threaded discussion for participants to discuss the ideas presented with others. This type of post videoconference event would allow a national discussion and sharing of ideas focused on the topic of the videoconference.

One limitation identified by two video stream participants who watched the conference together was that viewing the videoconference via video streaming did not allow them to stop the presentation, like they could a videotape, to discuss and process what they were seeing and hearing. In addition there were others who were unable to participate in the videoconference and asked if it was going to be available on videotape. Several social work educators and trainers also indicated a desire to use a videotaped copy for classes and/or for training sessions. As a result, the Center has made videotaped copies of the teleconference available at a reasonable cost ($25). This also speaks to the benefits of saving the video streamed event on a Web server for future access.

Also, due to normal office distractions (phones ringing, people stopping in, etc.) it is best to make arrangements for viewing a video streaming event in an uninterrupted environment. For instance, having phones forwarded to a reception area or wearing headphones, and posting a message on the office door or cubicle entrance that one is unavailable until a specified time, or finding a location that is free from both phones and visitors.

Whether delivered via satellite (synchronous, one way video/audio), interactive television (synchronous, two way video/audio), or video streaming (synchronous or asynchronous one way video/audio) the main programming uses for any technology will continue to be education and training. However, thinking futuristically, video streaming may also be used to do case consulting, client interviewing, client referrals, and client commitments. Anytime it is too disruptive or prohibitive to move people from one site to another video streaming could be an option. (For sensitive cases security could be guaranteed by password protected sites.) As the technology improves, the bandwidth expands, and resources diminish the uses and demand for video streaming will grow.

Media resources and social work. The strengths of video streaming are: the convenience of attending a conference at one's desktop or anywhere there is an Internet connection; the cost savings as uplink/downlink and transponder costs and ISDN (data phone lines) costs rise; and the availability of asynchronous playback anywhere/anytime. The limitations of video streaming are: the current technology limits the frame size and quality of the video picture; the number of people that can participate at one site is limited by computer screen size unless the image is projected or magnified (and such projection could create other difficulties); and the Internet congestion that causes buffering problems.

Conclusion

The use of internet technology by way of video streaming or Webcasting is one delivery method that is coming of age. Social work educators and trainers are joining their business, engineering and computer science colleagues in reviewing this new technology which allows expansion of movement beyond the boundaries of time and distance to reach learners, and which, with other advances in information technology, is creating a new educational paradigm.

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Biographical Sketches

Sandra C. Robin, PhD, LISW is the associate director for the Center for Advanced Studies in Child Welfare in the School of Social Work at the University of Minnesota, Twin Cities.

Address: 205 Peters Hall
1404 Gortner Avenue
St. Paul, MN 55108
Phone: (612) 624-4251
Fax: (612) 624-3744

Richard Reardon is a principal media producer in the College of Continuing Education at the University of Minnesota, Twin Cities.

Address: 540 Rarig Center
330 21st Ave. So.
Minneapolis, MN 55455
E-mail: reardon@tc.umn.edu
Phone: (612) 625-3486
Fax: (612) 624-6079

Billie V Strand is a media production supervisor in the College of Continuing Education at the University of Minnesota, Twin Cities.

Address: 540 Rarig Center
330 21st Ave. So., Minneapolis, MN 55455
E-mail: bstrand@cce.umn.edu
Phone: (612) 625-9044
Fax: (612) 624-6079

How to Develop SMIL Multimedia for Instruction

Yuwu Song, Ph. D
Web Developer/Instruction Librarian
Arizona State University

This workshop presentation shows the participants how to create online multimedia instruction using SMIL (Synchronized Multimedia Integration Language) and other multimedia components. It will focus on SMIL, a simple html-like mark-up language that can coordinate the timing and layout of streaming video clips, along with photos, graphics, animation, or other Web formats. SMIL can be created and accessed with ordinary hardware and modem connections, making it a low cost, low bandwidth streaming media option.

Introduction to SMIL

What Is SMIL

SMIL (pronounced smile) stands for Synchronized Multimedia Integration Language.

It was developed by the World Wide Web Consortium and released on June 15th 1998. It is a markup language (like HTML). SMIL is designed to solve the problems of coordinating and synchronizing the display of multimedia on Internet. With SMIL, you can position media elements wherever you want on the screen. You can synchronize those elements using a single time line and display media following user-preferences, language, bit-rate, etc.

A Simple Language

Like HTML, SMIL documents can be created with a simple text editor such as NotePad. It has a lot in common with HTML and other familiar web technologies such as URLs, CSS-based layout, HTML-based hyperlinking.

Provide TV-Like Content

The Web is short of a simple way to express synchronization over time -- for example, "play text file 1 in parallel with video file 2" or "display image 3 after audio file 4 is over". SMIL allows this type of information to be expressed, permitting TV-like web content to be produced.

Enrich Web Experiences

The Web is inherently interactive. SMIL enhances interactivity. In our example, users can use links embedded into the SMIL presentation to jump around within the video clip or go to an external web site.

Solve Bandwidth Problems

With SMIL, web developers, who want to create interactive multimedia content, can use low-bandwidth media types such as text and images directly instead of converting them into high-bandwidth video. You can create a product with large parts of the screen holding text, still images, and with full-motion video in only a small part of the screen real estate.

Internationalization Feature

SMIL is able to include multiple audio tracks in a variety of languages, make it possible to display multilingual multimedia documents.

Multimedia Components: RealVideo and RealText

These are components for a SMIL-based multimedia product. RealText is based on a plain-text mark-up language that contains its own formatting, effects, and timing information for the text it displays. It can develop mechanisms for moving type, vertical scrolling news, teleprompter, and the generic window type with which you can place static text on the player window with links to video clips.

RealVideo is a Real Networks video file format. In our example, it is an "rm" file.

The Basic Elements and Functions in the Sample SMIL and RealText Files

The layout sets the height and width of the entire presentation in pixels. Each region sets specific areas in the presentation that media will play to.

The <par> tags mean that they will play at the same time (in parallel). Each line between the <par></par> tags is a media file which will play to a specified region. Fill="freeze" means that the final frame will stay visible when that media file is done.

The RealVideo is played in the video_region. This area is defined as being located at left=320 and top=0. This places it against the top border, but 320 pixels from the left margin of the screen. The area is defined as being height="240" width="320".

The text_region is where the RealText is displayed. There are two external RealText files (library1content.rt, library1caption.rt) that control how the RealText is laid out and when it should appear. The text_region is located at left=0 and top=0. This places it against the left margin, 0 pixels down from the top of the player. The text_region2 is at left=320, top=240.

In the library1content.rt file, the command:seek() function sets the clock time which the presentation will seek to when that word is clicked. In the library1caption.rt file, the <time begin> tag tells each line what time it should appear on the screen.

Requirements for Viewing

32 MB of RAM
56.6 Kpbs modem
Internet Explorer 4.0, Netscape 4.0, or higher
Sound Card
Speakers, earphones or headphones
RealPlayer (free download: http://www.real.com)

Tools

RealPlayer 8 (G2). Developed by Real Networks, RealPlayer 8 (G2) is a Real Media specific player made more widely used with SMIL incorporation. It has become a primary driving force in the multimedia world on the web. There are millions downloaded.

GRiNS. GRiNS (GRaphical iNterface to SMIL) from www.cwi.com is a high-end SMIL authoring tool for complex presentations using RealPlayer formats.

QuickTime 5. Apple's QuickTime 5 provides SMIL support.

The SMIL-based Project

The project is composed of a video clip with narration, a few indexed links, and a moving caption based on the narration. The video is a regular VHS video clip digitized with Media 100 and saved as an "rm" file (streaming media file).

Sample Codes for the Project

1. library1.smil

```
<smil>
<head>
<layout>
    <root-layout width="640" height="420"/>
    <region id="text_region" width="320" height="480" left="0" top= '0"/>
    <region id="video_region" width="320" height="240" left="320" top="0"/>
    <region id="text2_region" width="320" height="180" left="320" top="240"/>
</layout>
</head>
<body>
<par>
```

```
    <textstream src="library1content.rt" region="text_region" fill="freeze" />
    <video src="library1.rm" region="video_region" fill="freeze" />
    <textstream src="library1caption.rt" region="text2_region" fill="freeze" />
</par>
</body>
</smil>
```

2. library1caption.rt

```
<window type="teleprompter" duration="213">
<font face="Arial" size=3 color="purple"><b>
<br/><time begin="1"/>
As a librarian, one of the questions I'm frequently asked is why do I need to go to the library when
everything is on the Internet.<br>
....
....

<br/><time begin="204"/>If you're looking for actual research on the Internet there is a
journal called Internet Research and that you're more likely to find in an academic library.

</b>
</font>
</window>
```

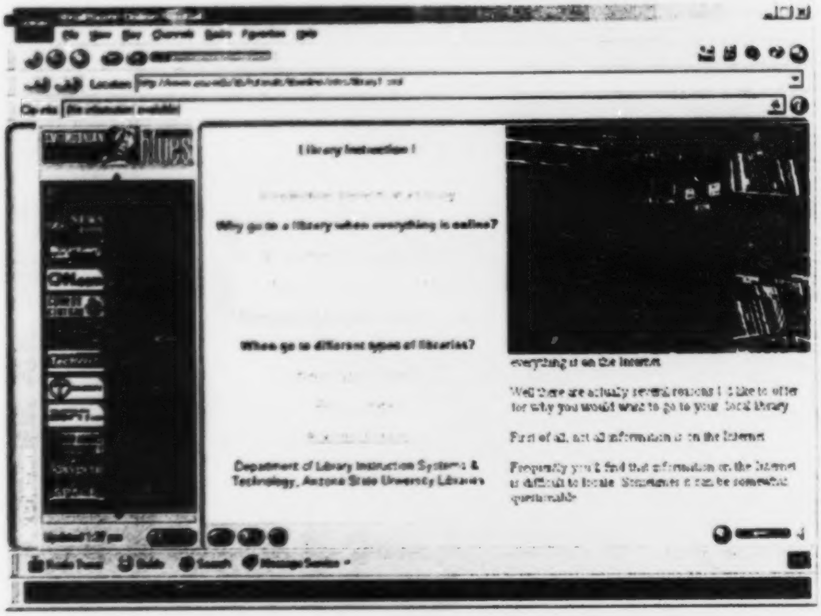
3. library1content.rt

```
<window type="generic" duration="214" height="420" width="320"
underline_hyperlinks="true"/>
<font face="Arial" size=5 color="black"><center><b>Library Instruction I</b><br></font>
<font face="Arial" size=3 color="black"><center>
<a href="command:seek(3)" target="_player"><br/><b>Introduction: benefits of a
library</b></a><br><br>
<b>Why go to a library when everything is online?</b><br>

....
....

<font face="Arial" size=3 color="#993333">Library Instruction Team<br><br>
August 2001</font>
</window>
```

Figure -1 shows an SMIL-based multimedia project



Library Instruction !

Why go to a library when everything is online?

When go to different types of libraries?

Department of Library Instruction Systems & Technology, Arizona State University Libraries

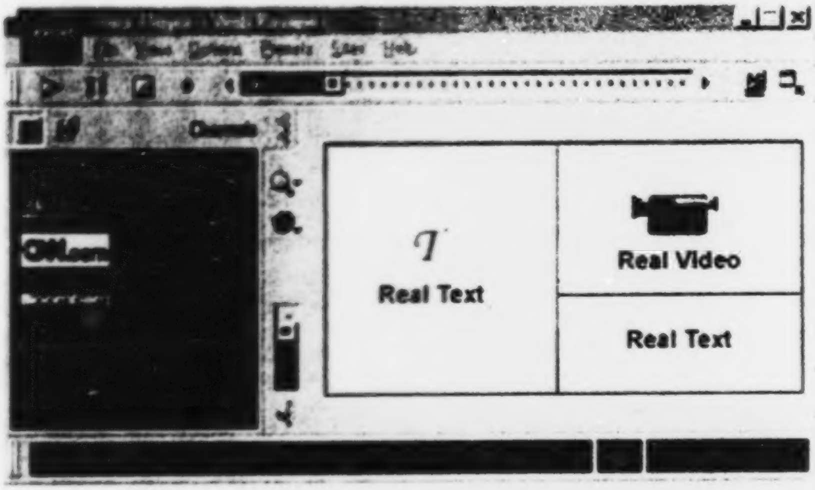
everything is on the Internet

Well there are actually several reasons I'd like to offer for why you would want to go to your local library

First of all, not all information is on the Internet

Frequently you'll find that information on the Internet is difficult to locate. Sometimes it can be somewhat questionable

Figure-2 shows how the code above defines the regions for laying out the elements of a synchronized presentation in a RealPlayer.



BEST COPY AVAILABLE

References

http://www.w3.org/TR/REC-SMIL
http://www.w3.org/TR/SMIL-Boston
http://www.justsmil.com
http://www.oratrix.com
http://www.real.com/player
http://www.cwi.ni/SMIL

Biographical Sketch

Dr. Yuwu Song is an assistant librarian in the Department of Library Instruction, Systems, and Technology at Arizona State University. His major duties include web development and library instruction.

Address: P.O. Box 871006
University Libraries
Arizona State University
Tempe, AZ 85287
E-mail: yuwu.song@asu.edu
Phone: (480) 965-2340

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or call 608-265-4159.